C21.5:1053/2

Vol. 1053 Number 2

RECEIVED
MIAMI UNIVERSITY
LIBRARIES
MAY 5 1985
DEPOSITORY
DOCUMENTS DEPARTMENT

OFFICIAL GAZETTE

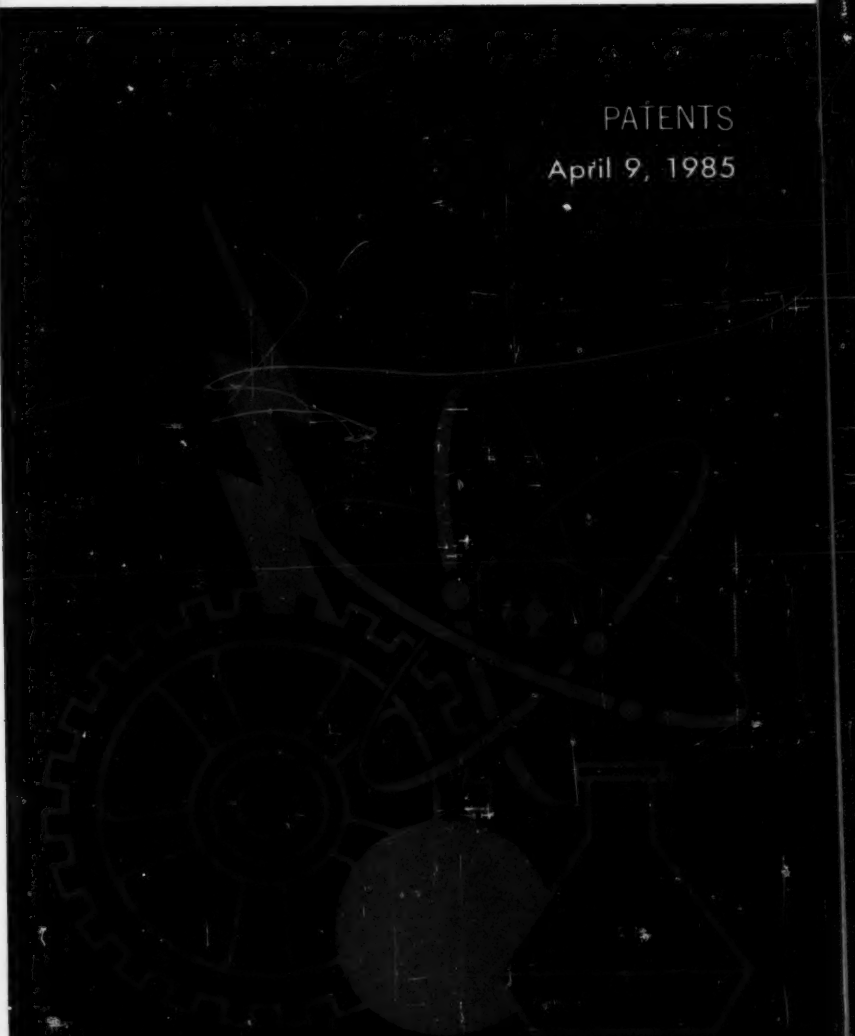
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

April 9, 1985



U.S.
DEPARTMENT
OF COMMERCE

Patent
and
Trademark
Office

PUBLISHED WEEKLY BY AUTHORITY OF CONGRESS

OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

April 9, 1985 Volume 1053 Number 2

CONTENTS

	Page
Patent and Trademark Office Notices	
Patent Cooperation Treaty (PCT) Information	1053 OG 32
Notice of Maintenance Fees Payable	1053 OG 32
Reissue Applications Filed	1053 OG 32
Requests for Reexaminations Filed	1053 OG 33
Marks Published for Opposition	1053 OG 33
Registration to Practice	1053 OG 33
Notice of Availability for Licensing	1053 OG 34
Patents Available for Licensing or Sale	1053 OG 35
Patent Certificates of Correction	1053 OG 37
Disclaimers	1053 OG 37
Dedication	1053 OG 38
Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries	1053 OG 39
Condition of Patent Applications	1053 OG 40
Reissue Patents Granted (31,861)	497
Plant Patents Granted (5,430)	499
Patents Granted	
General and Mechanical (4,509,213)	501
Chemical (4,509,948)	761
Electrical (4,510,343)	869
Design Patents Granted (278,279)	969
Index of Patentees	PI 1
Indices of Reissue, Design and Plant Patentees	PI 51
Classification of	
Patents (Including Reissues)	PI 55
Designs and Plants	PI 58
Geographical Index of Residence of Inventors	
Patents (Including Reissues)	PI 59
Designs and Plants	PI 60
Change of Address Form and Subscription Order Form	Back Page

The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.00 each; PLANT PATENTS in color, $8.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as a Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Domestic PCT fees were increased on Oct. 1, 1982 by a rule change to 37 CFR 1.445 that was published in the *Official Gazette* at 1021 O.G. 11 on Aug. 10, 1982.

The Search fee for the European Patent Office was changed as of Jan. 3, 1985 and was announced in the *PCT Gazette* at No. 26/1984 page 3241 on Nov. 8, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

International PCT fees were changed by the PCT Assembly effective Jan. 1, 1985 and were announced in the *PCT Gazette* at No. 24/1984 page 3095 on Oct. 25, 1984 and in the *Official Gazette* at 1050 O.G. 330 on Jan. 15, 1985.

The current schedule of PCT fees is as follows:

Transmittal fee	$ 125.00
Search fee	
U.S. Patent and Trademark Office as Searching Authority	
• No corresponding prior U.S. national application filed	500.00
• Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
• All cases	690.00
International fees	
Basic fee (first 30 pages)	265.00
Basic Supplemental fee (for each page over 30)	5.00
Designation fee (for the first 10 national or regional offices)	64.00
Designation fee for 11th and subsequent designations	no charge

DONALD J. QUIGG,
Acting Commissioner of Patents and Trademarks.

Feb. 4, 1985.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), effective Nov. 1, 1984. If the maintenance fee is not paid in a patent requiring such payment, the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Apr. 6, 1982 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Plant Patents	None
Utility Patents	4,322,858 through 4,324,002

Reissue Patents based on the above identified patents.

No maintenance fees are required for design patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant . . . $ 200.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 200.00
By other than a small entity . . . . . $ 400.00"

The amounts of the surcharges, effective Nov. 1, 1984, are set forth in 37 CFR 1.20(k)-(m), which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 100.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 50.00
By other than a small entity . . . . . $ 100.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee on a patent based on an application filed on or after Aug. 27, 1982, where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,250,338, Re. S.N. 701,004, Filed Dec. 21, 1984, Cl. 568/343, BRIDGED KETONES AND PROCESS FOR PREPARING SAME, Mark A. Sprecker, et al., Owner of Record: *International Flavors & Fragrances, Inc., New York, N.Y.*, Attorney or Agent: Arthur L. Liberman, et al., Ex. Gp.: 126

4,373,452, Re. S.N. 696,650, Filed Jan. 30, 1985, Cl. 110/203, WOOD BURNING STOVE, Robert V. van Dewoestine, Owner of Record: *Corning Glass Works,*

Corning, N.Y., Attorney or Agent: Russell J. Barron, et al., Ex. Gp.: 344

4,423,813, Re. S.N. 699,655, Filed Feb. 8, 1985, Cl. 206/506, MULTILEVEL STACKING CONTAINER, Elsmer W. Kreeger, et al., Owner of Record: *Pinckney Molded Plastics, Inc., Pinckney, Mich.*, Attorney or Agent: Andrew R. Basile, et al., Ex. Gp.: 241

4,446,302, Re. S.N. 700,848, Filed Feb. 11, 1985, Cl. 528/302, ELECTROSTATOGRAPHIC DEVELOPERS COMPRISING TONERS CONTAINING A POLYESTER HAVING P-HYDROXYBENZOIC ACID RECURRING UNITS, M. Akram Sandhu, et al., Owner of Record: *Eastman Kodak Co., Rochester, N.Y.*, Attorney or Agent: John R. Everett, et al., Ex. Gp.: 153

4,464,802, Re. S.N. 697,143, Filed Feb. 1, 1985, Cl. 004/506, STRUCTURAL FOAM SWIMMING POOL WALL AND BRACE AND METHOD OF ERECTING SAME, Robert L. Glonek, et al., Owner of Record: *Said Assors to Robert L. Glonek, Grand Rapids, Mich.*, Attorney or Agent: Peter P. Price, et al., Ex. Gp.: 243

4,467,590, Re. S.N. 701,321, Filed Feb. 13, 1985, Cl. 056/11.2, DRIVE REVERSING MECHANISM, Glenn A. Musser, et al., Owner of Record: *Sperry Corp., New Holland, Pa.*, Attorney or Agent: Frank A. Seemar, et al., Ex. Gp.: 333

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

3,953,394, Reexam. No. 90/000,736, Requested: Mar. 11, 1985, Cl. 524/86, POLYESTER ALLOYS AND MOLDING COMPOSITIONS CONTAINING THE SAME, Daniel W. Fox, et al., Owner of Record: *General Electric Co., Pittsfield, Mass.*, Attorney or Agent: William F. Mufatti, Ex. Gp.: 153, Requester: General Electric Co., New York, N.Y.

4,307,764, Reexam. No. 90/000,734, Requested: Mar. 8, 1985, Cl. 383/17, BULK MATERIAL TRANSPORT BAG, Peter J. Nattrass, Owner of Record: *Bulk Lift International, Inc., Des Plains, Ill.*, Attorney or Agent: Kinzer, Plyer, et al., Ex. Gp.: 241, Requester: Cajun Bag & Supply Co., Inc., Arlington, Va.

Marks Published for Opposition

The Apr. issues of the Official Gazette (Trademark Section) will present marks published for opposition in two separate sections.

Each section will contain both multiple class and single class applications. The first section will be printed at the beginning of the Official Gazette and the second section will be printed at the end of the Official Gazette, after the Index of Registrants.

The second section will be numbered separately from the first section, and each page will bear the notation Ap.

MARGARET M. LAURENCE,
Jan. 10, 1985. *Assistant Commissioner for Trademarks.*

Registration to Practice

The following list contains the names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of any of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before May 3, 1985:

HARRY I. MOATZ,
Mar. 12, 1985. *Office of Enrollment and Discipline.*

A

Ackerman, Steve W., 11908 Dorothy St., #201, Brentwood, Conn. 90049
Algieri, Aldo A., 113 Vanida La., Fayetteville, N.Y. 13066
Arismendi, Andres M. Jr., 9707 Ravensworth, Houston, Tex. 77031

B

Battison, Adrian D., Ade & Co., 1710-360 Main St., Winnipeg, Manitoba, Canada R3C 3Z3
Beltran, Howard, Box 702N, 2111 Jefferson Davis Hwy., Arlington, Va. 22202
Bundren, William J., 7469 Towchester Ct., Alexandria, Va. 22310

C

Chen, Chung C., 3603 Barcroft View Terr., #101, Baileys' Crossroads, Va. 22041

D

Douglas, Earl, 414 W. 120th St., #209, New York, N.Y. 10027

F

Feldman, William, 932 Schindler Dr., Silver Spring, Md. 20903
Frost, Hubert S., P.O. Box 313, Toronto, Canada M5L 1G1

G

Groseth, Craig C., 750 N. Dearborn, #1605, Chicago, Ill. 60610

H

Harrison, Al, 5206 Indigo, Houston, Tex. 77096

K

Konick, Bernard, 11617 Fulham St., Silver Spring, Md. 20902
Kosdan, Gary L., 321 E. 89th St., New York, N.Y. 10028
Kuehl, Gerhard, 86 Forrest Ave., Fair Haven, N.J. 07701

L

Linder, Walter C., 4201 Lakeside Ave., N, #316, Brooklyn Center, Minn. 55429

M

Mattern, Fred C., Jr., Rte. 3, Box 280, Warrenton, Va. 22186
Merkling, John R., 1105 W. 680 South, Orem, Utah 84058

P

Poulos, James A. III, 2307 Westview Dr., Silver Spring, Md. 20910

S

Sears, Jere W., 310 Melvin Ave., Annapolis, Md. 21401
Sheedy, John J., 2404 Mill Grove Rd., Pittsburgh, Pa. 15241
Stearns, Arlyce, 6705 Inverness Dr., Fort Wayne, Ind. 46804

T

Tager, Clifford L., 2124 I St., N.W. #800, Washington, D.C. 20037
Thein, James R., 2111 Jefferson Davis Hwy., Suite 71N, Arlington, Va. 22202
Toyooka, Yoshiharu, 1124 Cline Crescent, Ottawa, Ont., Canada K2C 2P2
Travnikoff, Basil, 333 N. Mills Ave., Lodi, Calif. 95240
Tungol, Maria P., 1305 Gatewood Dr., Alexandria, Va. 22307

Z

Zacharias, John P., 20 Kipp Dr., Fishkill, N.Y. 12524

U.S. GOVERNMENT-OWNED INVENTIONS
Notice of Availability for Licensing

The inventions listed below are owned by agencies of the U.S. Government and are available for licensing in the U.S. in accordance with 35 U.S.C. 207 to achieve expeditious commercialization of results of federally funded research and development. Foreign patents are filed on selected inventions to extend market coverage for U.S. companies and may also be available for licensing.

Technical and licensing information on specific inventions may be obtained by writing to:

Office of Federal Patent Licensing
U.S. Department of Commerce
P.O. Box 1423
Springfield, Va. 22151

Please cite the number and title of inventions of interest.

DOUGLAS J. CAMPION,
Office of Federal Patent Licensing
National Technical Information Service
U.S. Department of Commerce.

DEPARTMENT OF AGRICULTURE

SN 6-411,196 (4,497,898). SPECTROPHOTOMETRIC METHOD FOR SIMULTANEOUSLY ANALYZING PROTEIN AND FAT CONTENTS IN MILK.
SN 6-646,730. IMPROVED TRANSPORT CARRIAGE.
SN 6-649,038. FABRICATED WOOD BEAM.
SN 6-650,462. PROCESS FOR ENHANCED FERMENTATION OF XYLOSE TO ETHANOL.
SN 6-650,587. IMPROVED LOCKING BALLS FOR LOGGING CARRIAGE.
SN 6-662,378. DEVICE AND METHOD FOR MEASURING THE ENERGY CONTENT OF HOT AND HUMID AIR STREAMS.
SN 6-683,284. DIAGNOSTIC REAGENT FOR SWINE TRICHINOSIS.

DEPARTMENT OF HEALTH AND HUMAN SERVICES

SN 6-596,636 (4,497,730). METHOD FOR OBTAINING PERIPLASMIC PROTEINS FROM BACTERIAL CELLS USING CHLOROFORM.
SN 6-680,992. METHOD FOR RAPID DNA SEQUENCING.

DEPARTMENT OF THE AIR FORCE

SN 6-258,500 (4,487,476). METHOD OF MULTIVARIANT INTRACLASS PATTERN RECOGNITION.
SN 6-308,972 (4,484,297). VARIABLE DATA BASE GENERATOR APPARATUS.
SN 6-324,346 (4,488,311). OPTICALLY PUMPED IODINE MONOFLUORIDE LASER.
SN 6-343,042 (4,495,502). MULTIPLE LOOP SIDELOBE CANCELLER.
SN 6-366,732 (4,495,466). EDDY CURRENT TEST PROBE WITH CIRCUMFERENTIAL SEGMENTS AND METHOD OF TESTING MATERIAL SURROUNDING FASTENER HOLES.
SN 6-366,746 (4,489,289). SAW OSCILLATOR WITH DIGITIAL COMPENSATION FOR TEMPERATURE RELATED FREQUENCY CHANGES.
SN 6-373,084 (4,495,501). METHOD AND MEANS FOR PROVIDING FREQUENCY AGILE OPERATION OF MTI RADAR.
SN 6-375,621 (4,483,006). AXIAL FLOW LASER CAVITY.
SN 6-384,292 (4,484,332). MULTIPLE DOUBLE HETEROJUNCTION BURIED LASER DEVICE.
SN 6-393,834 (4,484,722). TRANSLATING RUDDER PEDAL SYSTEM.
SN 6-398,132 (4,494,838). RETINAL INFORMATION MAPPING SYSTEM.
SN 6-417,726 (4,482,900). DEPLOYABLE FOLDED ANTENNA APPARATUS.
SN 6-418,952 (4,482,112). WINDBLAST ARM PROTECTOR ASSEMBLY.
SN 6-422,430 (4,496,917). RF-PRIMED HIGH POWER HALOGEN VIAL APPARATUS.
SN 6-435,522 (4,494,827). IMAGING APPARATUS FOR TRANSVERSE ELECTRODE ELECTRO-OPTIC TUNABLE FILTER.
SN 6-437,655 (4,488,914) PROCESS FOR THE EPITAXIAL DEPOSITION OF III-V COMPOUNDS UTILIZING A CONTINUOUS IN-SITU HYDROGEN CHLORIDE ETCH.
SN 6-444,003 (4,491,845). WIDE ANGLE PHASED ARRAY DOME LENS ANTENNA WITH A REFLECTION/TRANSMISSION SWITCH.
SN 6-445,639 (4,489,324). LOW SIDELOBE PHASED ARRAY ANTENNA SYSTEM.
SN 6-445,646 (4,490,829). DETECTION OF ANGULAR MODULATED ELECTROMAGNETIC SIGNALS.
SN 6-445,887 (4,490,002). RELEASABLE CABLE CONNECTOR ASSEMBLY FOR USE BETWEEN A MOBILE AND STATIONARY OBJECT.
SN 6-452,604 (4,485,361). PULSE TRANSFORMER PACKAGE FOR IMPEDANCE MATCHING A LASER DIODE TO A TRANSMISSION LINE.
SN 6-455,673 (4,483,198). OSTEOCLAST FOR WHOLE BONE TESTING.
SN 6-461,424 (4,487,550). COOLED TURBINE BLADE TIP CLOSURE.
SN 6-461,427 (4,489,322). RADAR CALIBRATION USING DIRECT MEASUREMENT EQUIPMENT AND OBLIQUE PHOTOMETRY.
SN 6-465,213 (4,480,958). HIGH PRESSURE TURBINE ROTOR TWO-PIECE BLADE RETAINER.
SN 6-468,781 (4,487,640). METHOD FOR THE PREPARATION OF EPITAXIAL FILMS OF MERCURY CADMIUM TELLURIDE.
SN 6-469,176 (4,485,314). POWER CIRCUIT UTILIZING SELF-EXCITED HALL EFFECT SWITCH MEANS.
SN 6-469,370 (4,481,707). METHOD FOR THE FABRICATION OF DIELECTRIC ISOLATED JUNCTION FIELD EFFECT TRANSISTOR AND PNP TRANSISTOR.

SN 6-475,664 (4,488,713). PNEUMATIC CLAMPING DEVICE.
SN 6-484,329 (4,490,973). FLAMEHOLDER WITH INTEGRATED AIR MIXER.
SN 6-493,387 (4,495,505). PRINTED CIRCUIT BALUN WITH A DIPOLE ANTENNA.
SN 6-498,238 (4,482,259). LASER CLOCK.
SN 6-498,335 (4,495,764). INTEGRATED INSULATION WALL ASSEMBLY.
SN 6-502,771 (4,487,068). METHOD AND APPARATUS FOR DETECTING ACOUSTIC EMISSIONS FROM METAL MATRIX WIRE.
SN 6-552,555 (4,495,782). TRANSMISSIVE DEWAR COOLING CHAMBER FOR OPTICALLY PUMPED SEMICONDUCTOR RING LASERS.
SN 6-574,433 (4,482,398). METHOD FOR REFINING MICROSTRUCTURES OF CAST TITANIUM ARTICLES.
SN 6-643,203. TALLY CELL CIRCUIT.
SN 6-649,445. AUTOMATED PARTS STORAGE AND RETRIEVAL SYSTEM POSITIONING DEVICE AND METHOD.
SN 6-659,920. HIGH VOLTAGE RF COAXIAL CABLE.
SN 6-679,333. DOUBLE PINHOLE SPATIAL PHASE CORRELATOR APPARATUS.

DEPARTMENT OF THE ARMY

SN 6-488,249 (4,493,741). AMINE SALTS AS BONDING AGENTS.
SN 6-669,147. NORMAL COORDINATE MONOLITHIC CRYSTAL FILTER.
SN 6-677,274. FREEZE DRIED RAW MEATS.
SN 6-690,358. STRESS COMPENSATED CRYSTAL DEVICE.

DEPARTMENT OF THE INTERIOR

SN 6-168,815 (4,497,578). MACHINE FOR MIXING AND INJECTING WATER AND GROUT INTO A ROOF BOLT HOLE.
SN 6-577,459 (4,498,928). DUCTILE DUPLEX IRON-BASED ALLOY CONTAINING ALUMINUM.

Patents Available for Licensing or Sale

General Electric Co. is prepared to grant non-exclusive licenses under the following patents upon reasonable terms to domestic manufacturers.

Applications for license may be addressed to: General Electric Co., Motor Business Group, 1635 Broadway, P.O. Box 2204, Fort Wayne, Ind. 46801-2204, Attention: Patent Counsel.

4,433,466. APPARATUS FOR MAKING AND USING SLOT CLOSURE WEDGES AT A COIL INJECTION STATION.
4,443,934. METHOD OF ASSEMBLING PERMANENT MAGNET DC MACHINES.
4,466,762. TOOL FOR FORMING INTERNAL SCREW THREADS.
4,469,970. ROTOR FOR PERMANENT MAGNET EXCITED SYNCHRONOUS MOTOR.
4,472,651. PERMANENT MAGNET ROTOR.
4,477,306. LAMINATED CORE, APPARATUS AND METHODS.
4,479,081. STEP MOTOR DRIVE.

Applications for licenses may be addressed to the Patent Counsel, Military Electronic Systems Operation, General Electric Co., Bldg. 2, Rm. 205, Electronics Park, Syracuse, N.Y. 13221.

4,277,787. CHARGE TRANSFER DEVICE PHASED ARRAY BEAMSTEERING AND BEAMFORMER.
4,303,898. LONGITUDINALLY FLANGED WAVEGUIDE.
4,321,526. RIPPLE CURRENT STABILIZED CONTROL LOOP FOR SWITCHING REGULATOR.
4,349,915. MINIMIZATION OF MULTIPATH AND DOPPLER EFFECTS IN RADIANT ENERGY COMMUNICATION SYSTEMS.

Applications for licenses may be addressed to: General Electric Co., Construction Equipment Business Operation, P.O. Box 704, Farmington, Conn. 06034-0704 Att: Richard A. Menelly, Patent Counsel.

4,484,045. MOLDED CASE CIRCUIT BREAKER HAVING IMPROVED ARC RESISTANT PROPERTIES.
4,484,045. MOLDED CASE CIRCUIT BREAKER HAVING IMPROVED ARC RESISTANT PROPERTIES.
4,485,283. CURRENT LIMITER UNIT.

Applications for license may be addressed to Patent Counsel, Steam Turbine-Generator/Lynn Operations, General Electric Co., 1100 Western Ave., Lynn, Mass. 01910.

4,437,809. TURNING GEAR INTERLOCK.
4,443,725. DYNAMOELECTRIC MACHINE STATOR WEDGE.
4,469,971. STATOR SLOT WEDGE ASSEMBLY WITH AXIAL SPRING RETAINER.

Applications for license may be addressed to Patent Counsel, Industrial & Marine Steam Turbine Division, General Electric Co., 1100 Western Ave., Lynn, Mass. 01910.

4,063,872. UNIVERSAL BURNER.
4,082,115. VALVE OPERATOR.
4,190,961. METHOD AND APPARATUS FOR ALIGNING TURBINE INTERNAL COMPONENTS.
4,033,234. THROTTLE VALVE OPERATOR.
4,018,083. VIBRATION DETECTION PROBE HOLDER.
4,402,183. SLIDING PRESSURE FLASH TANK.
4,391,101. ATTEMPERATOR-DEAERATOR CONDENSER.
4,419,578. A SOLID STATE NEUTRON DETECTOR. Kenneth A. Kress, Correspondence address: Dr. Kennedy L. Wilson, Chairman, CIA Patents Board, Central Intelligence Agency, Washington, D.C. 20505.
4,409,544. INSTRUMENTS FOR MEASUREMENT OF CARRIER POWER AND ANTENNA IMPEDANCE IN AM BROADCASTING. Robert W. Redlich, 9 Grand Park Blvd., Athens, Ohio 45701.
4,393,925. STOVE PIPE HEAT EXTRACTOR. Ken Jacobsen, P.O. Box 283, Beaverton, Oreg. 97075.
4,389,893. PRECISION ULTRASOUND ATTENUATION MEASUREMENT. Jack E. Haken, Esq., North American Philips Corp., 580 White Plains Rd., Tarrytown, N.Y. 10591 (914) 332-0222.
4,163,438. ROTARY VALVE TIMING APPARATUS. Dana Corp., P.O. Box 1000, Toledo, Ohio 43697.
4,107,975. METHOD AND APPARATUS FOR TESTING SHOCK ABSORBERS AND THE LIKE. William P. Cargile, P.O. Box 10101, Palo Alto, Calif. 94303.
4,034,596. METHOD AND APPARATUS FOR TESTING SHOCK ABSORBERS AND THE LIKE. William P. Cargile, P.O. Box 10101, Palo Alto, Calif. 94303.
3,948,227. STRATFIELD CHARGE ENGINE. Dana Corp., P.O. Box 1000, Toledo, Ohio 43697.
D-275,685. ELECTROMOTIVE CAMERA LENS OR SIMILAR ARTICLE. Oma Mfg. Co., Ltd., Tokyo, Japan. Correspondence to: Holman & Stern, Chartered, 2401 Fifteenth St., N.W., Washington, D.C. 20009. Folio: 47965-D.

4,489,795. SHOCK RESISTANT DIGGING IRON. Richard F. Leidy, 4910 Arters Mill Rd., Westminister, Md. 21157.

4,484,516. CLAMP FOR PRESSING FOOD IN PAN DURING COOKING. Lev Bimman, Skogveien 117, 1320, Stabekk, Norway. Correspondence to: P.O. Box 9504, Arlington, Va. 22209.

4,484,066. GARMENT-COUNTING APPARATUS. Paul L. DeBlieux, et al. Prospective assignees or licensees should contact: Reginald F. Roberts, Jr., P.O. Box 515, Baton Rouge, La. 70821.

4,477,912. CORRELATION DATA COMMUNICATIONS SYSTEM. James A. Oliff, Esq., Parkhurst & Oliff, 277 S. Washington St., Suite 212, Alexandria, Va. 22313 (703) 836-6400.

4,475,647. ROPE BUCKET ELEVATOR. Gerts Diner/Liza Kremerova. Correspondence should be addressed to: Martin W. Schiffmiller, Esq., Kirschstein, Kirschstein, et al., 551 Fifth Ave., New York, N.Y. 10176.

PATENT NOTICES

Certificates of Correction for the Week of Apr. 9, 1985

Pp. 3,971	4,444,322	4,465,532	4,477,585
Pp. 5,242	4,444,343	4,465,569	4,479,770
Pp. 5,311	4,444,597	4,466,651	4,479,847
Pp. 5,312	4,445,622	4,467,257	4,480,064
Pp. 5,313	4,445,791	4,467,342	4,480,326
Pp. 5,314	4,446,107	4,467,414	4,480,473
D. 262,296	4,450,078	4,467,560	4,481,066
4,031,235	4,450,269	4,467,617	4,481,088
4,140,089	4,450,474	4,467,993	4,481,198
4,197,744	4,450,752	4,468,310	4,481,344
4,243,142	4,451,592	4,468,749	4,481,365
4,264,595	4,451,647	4,469,132	4,481,428
4,289,289	4,452,350	4,469,288	4,481,577
4,339,173	4,452,784	4,469,292	4,482,004
4,371,825	4,452,884	4,469,660	4,482,099
4,374,472	4,453,183	4,469,707	4,482,204
4,379,853	4,453,559	4,469,849	4,482,234
4,379,943	4,453,806	4,470,012	4,482,327
4,380,473	4,454,206	4,470,044	4,482,332
4,393,637	4,455,661	4,470,133	4,482,338
4,394,741	4,455,733	4,470,468	4,482,417
4,400,548	4,456,803	4,470,851	4,482,530
4,400,615	4,457,230	4,471,066	4,482,689
4,401,803	4,457,569	4,471,425	4,482,742
4,402,972	4,457,710	4,471,460	4,482,834
4,403,108	4,457,727	4,471,672	4,483,019
4,403,490	4,457,731	4,471,686	4,483,083
4,408,387	4,458,256	4,472,169	4,483,103
4,408,468	4,458,336	4,472,200	4,483,356
4,413,416	4,458,643	4,472,362	4,483,379
4,417,375	4,458,764	4,472,480	4,483,495
4,423,961	4,459,036	4,472,562	4,483,506
4,426,003	4,459,356	4,472,876	4,483,543
4,427,104	4,459,680	4,472,914	4,483,708
4,428,693	4,459,754	4,473,279	4,483,752
4,429,003	4,460,563	4,473,354	4,483,770
4,429,769	4,460,632	4,473,600	4,484,244
4,431,442	4,460,640	4,473,750	4,484,264
4,437,406	4,460,923	4,473,961	4,484,288
4,438,172	4,460,998	4,474,056	4,484,832
4,438,417	4,461,013	4,474,166	4,484,920
4,438,419	4,461,944	4,474,425	4,484,959
4,440,142	4,462,328	4,474,556	4,485,225
4,441,764	4,462,369	4,474,787	4,485,274
4,441,843	4,462,718	4,475,716	4,485,283
4,442,851	4,463,124	4,476,383	4,485,506
4,443,448	4,464,002	4,476,430	4,490,416
4,443,809	4,464,576	4,477,504	

Disclaimers

4,006,267.—*Philip Kurz,* deceased, late of Columbus, Ohio; by Jessie M. Kurz, executrix, Rockhill, S.C. COLOR HIGHLIGHTING PROCESS. Patent dated Feb. 1, 1977. Disclaimer filed Jan. 22, 1985, by the assignee, *Xerox Corp.*

Hereby enters this disclaimer to claims 1 through 10, inclusive of said patent.

4,188,541.—*Godfrey N. Hounsfield,* Newark, England. APPARATUS FOR EXAMINING A BODY BY RADIATION SUCH AS X OR GAMMA RADIATION. Patent dated Feb. 12, 1980. Disclaimer filed Feb. 24, 1983, by the assignee, *EMI Ltd.*

The term of this patent subsequent to Dec. 11, 1990 has been disclaimed.

4,350,626.—*Yasuhiko Masuho* and *Takeshi Hara,* Tokyo, Japan. ANTITUMOR PROTEIN HYBRID AND PROCESS FOR THE PREPARATION THEREOF. Patent dated Sept. 21, 1982. Disclaimer filed Jan. 28, 1985, by the assignee, *Teijin Ltd.*

Hereby enters this disclaimer to claims 1 through 6 of said patent.

4,364,212.—*Robert J. Pearson,* Tonawanda and *Rodney G. Buergin,* Snyder, N.Y. FIRE-RESISTANT METAL STUD. Patent dated Dec. 21, 1982. Disclaimer filed Feb. 4, 1985, by the assignee, *National Gypsum Co.*

The term of this patent subsequent to Oct. 12, 1999 has been disclaimed.

4,396,938.—*Robert A. Dischert,* Burlington, N.J. CONTROLLED RAM SIGNAL PROCESSOR. Patent dated Aug. 2, 1983. Disclaimer filed Jan. 17, 1985, by the assignee, *RCA Corp.*

Hereby enters this disclaimer to claims 16 and 17 of said patent.

4,423,745.—*William C. Butt* and *Buford L. Almond,* Lynchburg, Va. RINSING MACHINE. Patent dated Jan. 3, 1984. Disclaimer filed Feb. 4, 1985, by the assignee, *Simplimatic Engineering Co.*

Hereby enters this disclaimer to all claims of said patent.

4,436,612.—*Soni O. Oyekan,* Piscataway, N.J., and *George A. Swan,* Baton Rouge, La. CATALYTIC REFORMING PROCESS. Patent dated Mar. 13, 1984. Disclaimer filed Feb. 4, 1985, by the assignee, *Exxon Research and Engineering Co.*

Hereby enters this disclaimer to claims 1-3 and 6-15 of said patent.

4,444,703.—*Richard J. G. Dominguez* and *Doris M. Rice,* Austin, Tex. REINFORCED REACTION INJECTION MOLDED ELASTOMERS. Patent dated Apr. 24, 1984. Disclaimer filed Feb. 1, 1985, by the assignee, *Texaco, Inc.*

Hereby enters this disclaimer to claims 1 through 21 of said patent.

4,448,127.—*John J. Frain,* Clearwater, Fla. METHOD OF PRODUCING STACKS OF TICKET STACKS. Patent dated May 15, 1984. Disclaimer filed Jan. 17, 1985, by the assignee, *Metro Game Manufacturing Corp.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

4,468,531.—*James H. Postlethwait,* Hartford and *William F. Olashaw,* and *Roger Kusek,* Plainville, Conn. SAFETY SHIELD ASSEMBLY FOR A DRAWOUT-TYPE CIRCUIT BREAKER. Patent dated Aug. 28, 1984. Disclaimer filed Nov. 14, 1984, by the assignee, *General Electric Co.*

Hereby enters this disclaimer to all claims of said patent.

Dedication

4,406,480.—*Lewis B. Izzi*, Shelby, N.C. WATER CLOSET COUPLING. Patent dated Sept. 27, 1983. Dedication filed Feb. 11, 1985, by the assignee, *Plastic Oddities, Inc.*

Hereby dedicates the remaining term of said patent to the People of the United States of America.

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Science Library, Arizona State University	(602) 965-7607
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 738-5580
Colorado	Denver Public Library	(303) 571-2122
Delaware	Newark: University of Delaware	(302) 738-2238
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 579-5001
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1706
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4283
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-5125
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4277
Pennsylvania	Cambridge Springs: Alliance College Library	(814) 398-2098
	Philadelphia: Franklin Institute Library	(215) 448-1227
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina	(803) 792-2372
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
Texas	Austin: McKinney Engineering Library, University of Texas	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3043

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF February 2, 1985

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	7-25-83
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	6-01-83
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	8-05-82
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	1-24-83
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	8-01-81
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	9-30-81
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	3-17-82
RECEPTACLES, CLEANING, WINDING, AND MEASURING, GROUP 240—G. M. FORLENZA, Director	3-07-83
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—S. S. MATTHEWS, Director	7-19-80
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	10-25-68
DESIGN, GROUP 290—K. L. CAGE, Director	9-17-82
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	4-17-83
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	3-19-83
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	10-29-82
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	12-21-81
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-15-82

Expiration of patents: The patents within the range of numbers indicated below expire during February 1985, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,366,970 to 3,371,350, inclusive

Plant Patents ..... Numbers 2,784 to 2,793 inclusive

REISSUES

APRIL 9, 1985

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 31,861

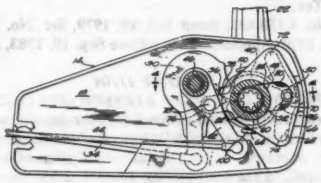
SINGLE LEVER REMOTE CONTROL FOR ENGINE THROTTLE AND CLUTCH

Anthony P. Prince, Waukegan, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Original No. 4,232,771, dated Nov. 11, 1980, Ser. No. 1,486, Jan. 8, 1979. Continuation of Ser. No. 789,798, Apr. 22, 1977, abandoned. Application for reissue Nov. 9, 1982, Ser. No. 440,415

Int. Cl.[3] **B60K** *29/02*

U.S. Cl. 192—0.096 **13 Claims**



11. A throttle control for an engine having a throttle and a clutch, said control comprising a housing, a control lever mounted on said housing for rotation relative to a neutral position, a shaft member supported within said housing for rotation relative to said housing and connected to said control lever for common rotation therewith, said shaft member being further supported within said housing for axial movement relative to said housing between first and second positions in response to axial movement of said control lever, a throttle lever movably mounted on said housing and adapted to be connected to the engine throttle for actuation thereof in response to movement of said throttle lever, a throttle drive member including a drive pin and connected to said shaft member for rotation in response to movement of said control lever from the neutral position, a shift lever adapted to be connected to the engine clutch for actuation thereof in response to shift lever movement, said shift lever being movably mounted on said housing for movement between a neutral position and a shift position in response to movement of said shift lever, means releasably connecting said shift lever to said shaft member so as selectively to move said shift lever from the neutral position to the shift position in response to rotational movement of said control lever from the neutral position and to permit relative rotation between said shift lever and said shaft member in response to rotational movement of said control lever, said means connecting said shift lever to said shaft member including a shift drive member mounted on said shaft member for relative rotary movement therebetween, means connecting said shift lever and said shift drive member, and drive means for releasably connecting said shift drive member and said throttle drive member to provide common rotary movement of said shift drive member and said throttle drive member when said shaft member is in the first position and to permit relative rotation between said shaft member and said shift drive member, in response to rotational movement of said control lever, when said shaft member is in the second position, a cam member connected between said throttle lever and said throttle drive member for movement between an idle position and throttle advance positions in response to rotation of said throttle drive member, said cam member including a cam track receiving said drive pin and having a central portion extending at a uniform radius from the rotational axis of said shaft member and end portions extending from said central portion at increasing distances from the rotational axis of said shaft member, and guide means located on said cam member and on said housing for guiding movement of said cam member in response to movement of said drive pin in said cam track, whereby said cam member remains in the idle position while said drive pin travels in said cam track central portion in response to rotation of said throttle drive member and said cam member moves from the idle position to a throttle advance position after said drive pin enters into and travels within one of said cam track end portions in response to rotation of said throttle drive member.

12. A control in accordance with claim 11 and further including lockout means for preventing rotation of said shift drive member when said shaft member is in said second position.

Re. 31,862

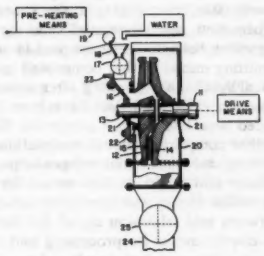
APPARATUS FOR THE TREATMENT OF LIGNOCELLULOSIC MATERIAL

Kenneth C. Logan, Jakarta, Indonesia, and Friedrich O. B. Ludhe, Bethesda, Md., assignors to Sunds Defibrator, Inc., Minn.

Original No. 3,948,449, dated Apr. 6, 1976, Ser. No. 465,056, Apr. 29, 1974. Division of Ser. No. 231,694, Mar. 3, 1972, Pat. No. 3,808,090, which is a continuation-in-part of Ser. No. 77,374, Oct. 1, 1970, abandoned, which is a continuation of Ser. No. 888,728, Dec. 29, 1969, abandoned, which is a continuation-in-part of Ser. No. 704,497, Dec. 14, 1967, abandoned, which is a continuation-in-part of Ser. No. 569,351, Aug. 1, 1966, abandoned, which is a continuntion-in-part of Ser. No. 357,008, Mar. 25, 1964, abandoned, which is a continuation-in-part of Ser. No. 159,329, Dec. 14, 1961, abandoned. Application for reissue Mar. 22, 1983, Ser. No. 477,842

Int. Cl.[3] **B02C** *23/24*

U.S. Cl. 241—41 **2 Claims**



2. Apparatus for producing a paper making pulp comprised of a predominance of long unbroken fibers and having a brightness in excess of 50 G.E. and a Canadian Standard Freeness not exceeding [510 c.c.] *364 c.c.* comprising abrading means, housing means surrounding said abrading means for maintaining said abrading means in a pressurized environment, supply means for feeding lignocellulosic fibrous particles to said abrading means and means for supplying a substantial quantity of liquid water to said abrading means while maintaining a pressurized environment in said housing, discharge means for removing the fibrous end product from said housing means while maintaining a pressurized environment inside of the housing means, drive means for operating said abrading means with a minimum total power consumption of 30 horsepower days per ton of fibrous end product and means for supplying a pressure medium to said housing means.

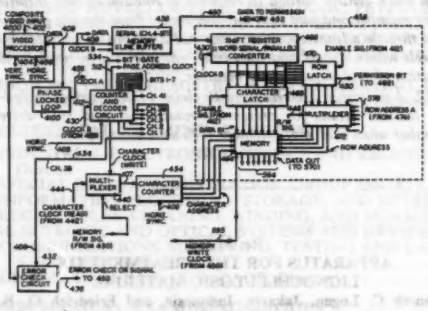
Re. 31,863
ROW GRABBING SYSTEM

Richard Saylor, Monsey, and Robert H. Nagel, New York, both of N.Y., assignors to IDR, Inc., Farmingdale, N.Y.

Original No. 4,042,958, dated Aug. 16, 1977, Ser. No. 611,843, Sep. 10, 1975. Application for reissue May 23, 1983, Ser. No. 496,831

Int. Cl.³ H04N *1/02*

U.S. Cl. 358—141 **33 Claims**



1. A real time frame grabbing system for substantially instantaneously providing a continuous video display of a selectable predetermined video frame of information on a video display means from continuously transmittable video information comprising means for transmitting said video information as a plurality of pseudo video scan lines, each of said pseudo video scan lines having a television video scan line format and capable of comprising a complete self-contained packet of digital information sufficient to provide an entire displayable row of video data characters, said pseudo video scan line having an associated transmission time equivalent to said television video scanline, said packet of digital information comprising at least address information for said displayable row and data information for said displayable characters in said displayable row, each of said pseudo video scan lines further comprising a horizontal sync signal at the beginning thereof and a start bit pulse between said horizontal sync signal and said packet of digital information, said horizontal sync signal providing a record separator between adjacent psuedo video scan lines, said transmitting means further comprising means for providing a vertical sync signal [signal] after a predetermined plurality of pseudo video scan lines have been transmitted, said pseudo video scan line being a composite video signal, said system further comprising television signal distribution means for distributing said transmitted composite pseudo video scan line signals to said video display means for providing said continuous video display and receiver means operatively connected between said television signal distribution means and said video display means for processing said distributed composite pseudo video scan line signals and capable of providing a displayable video row signal to said video display means from each of said pseudo video scan line signals pertaining to said selected frame for providing said [containing] *continuous* video display, [a predetermined plurality of displayable video rows comprising a displayable video frame of information,] said start bit pulse providing a unique synchronizing pulse for each transmitted pseudo video scan line for enabling precise determination of a sampling time for the received distributed pseudo video scan line to enable accurate determination of the binary state of the bits comprising said digital information packet, said receiver signal processing means comprising means responsive to the occurrence of said bit *and said horizontal sync signal* for each distributed pseudo video scan line for providing a reset signal for resetting said processing means in response to detection of said start bit *for enhancing immunity of said system to any noise or jitter present in said horizontal sync signal,* whereby noise immunity and accurate signal information detection are enhanced.

Re. 31,864
SELF-TEST FEATURE FOR APPLIANCE OR ELECTRONIC SYSTEMS OPERATED BY MICROPROCESSOR

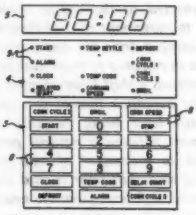
Michael G. van Bavel, Sugarland, and Alan J. Shannon, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Original No. 4,158,431, dated Jun. 19, 1979, Ser. No. 749,487, Dec. 10, 1976. Application for reissue Sep. 19, 1983, Ser. No. 533,838

Int. Cl.³ G06F *11/04*

U.S. Cl. 371—20 **25 Claims**

1. Apparatus *with self-test initiated at power-up, said apparatus* having a plurality of electrically operated devices including electrically operated visible indicia, a plurality of manually operable input means for entering functional commands, microprocessor means connected to the devices and receiving inputs from the input means, said microprocessor means containing a fixed, permanently programmed read-only-memory for storing instruction words which define operating sequences for the apparatus, the microprocessor means further including logic means for sequentially executing the instruction words to operate the devices in response to commands from the input



means, *an off-on switch for controlling the supply of power to the apparatus,* the microprocessor means having self-contained test control means operable in response to actuation thereof *by actuation means* without external control equipment to energize at least some of said electrically operated devices in sequence, the test control means including a sequence of said instruction words in the read-only-memory, *the actuation means initiating said sequence of instruction words for self-test upon power-up of said apparatus by means of said off-on switch.*

PLANT PATENTS

GRANTED APRIL 9, 1985

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,430
HEATHER NAMED ERICA PACIFICA

Bruno L. Imazio, Watsonville, Calif., assignor to Bruno Imazio Partnership, Watsonville, Calif.

Filed Mar. 25, 1983, Ser. No. 478,740
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—54 **1 Claim**

1. A new variety of heather, substantially as herein shown and described, particularly characterized by its very early blooming habit as compared with its seed parent.

5,431
ALSTROEMERIA NAMED STALRAMA

Jacob van Andel, Jac. Takkade 9a 1432 CA, Aalsmeer, Netherlands, assignor to B. V. Handelskwekerij/M. C. van Staaveren, Aalsmeer, Netherlands

Filed Aug. 11, 1983, Ser. No. 522,256
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—68 **1 Claim**

1. The new and distinctive alstroemeria cultivar, substantially as herein shown and described, particularly distinguished from its parent Red Sunset (U.S. Plant Pat. 4,635) by its deeper red flower color and its abundance of foliage.

5,432
CARNATION NAMED LONTOCIA

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 11, 1983, Ser. No. 512,727
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct carnation cultivar, substantially as herein shown and described, characterized in particular by the shrimp red color of its blooms which are streaked with union jack red; and by its vigorous and rigid growth habit, moderately abundant foliage and relatively few branches.

5,433
CARNATION NAMED LONKORPI

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 25, 1983, Ser. No. 516,512
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct variety of spray carnation, substantially as herein shown and described, characterized by the chartreuse yellow coloration of its small blooms, the petals of which are edged with a combination of cardinal red and greyed purple. The flowers of this plant are produced profusely on long, straight and strong flowering stems and the plant has a vigorous and upright growth habit with abundant foliage and resistance to *Fusarium oxysporum.*

5,434
CARNATION NAMED LONBLITEC

Nicole Barberet, and Yves Ducloux, both of Antibes, France, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Jul. 25, 1983, Ser. No. 516,565
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—70 **1 Claim**

1. A new and distinct spray carnation cultivar, substantially as herein shown and described, characterized by the very white color of its small blooms which are produced profusely on tall, straight and strong flowering stems which have a vigorous and upright growth habit with abundant foliage and resistance to *Fusarium oxysporum.*

5,435
CARNATION NAMED LONTARION

Nicoletta Baratta, and Giacomo Nobbio, both of San Remo, Italy, assignors to Laboratoire de Physiologie Vegetale de La Londe, Antibes, France

Filed Aug. 11, 1983, Ser. No. 522,100
Int. Cl.³ A01H *5/00*
U.S. Cl. Plt.—73 **1 Claim**

1. The new and distinct carnation cultivar, substantially as herein shown and described, characterized by its abundant production of bright, medium sized blooms, its regularly recurrent blooming habit, and its resistance to *Fusarium oxysporum.*

PATENTS

GRANTED APR. 9, 1985

ERRATA

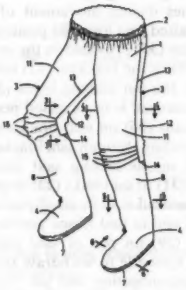
For CLASS	See PATENT NO.
123–440	4,509,502
277–082	4,509,773
384–099	4,509,804
357–081	4,509,839
514–002	4,510,130
514–011	4,510,132
514–030	4,510,133
514–027	4,510,134
514–056	4,510,135
514–063	4,510,136
514–080	4,510,137
514–206	4,510,138
514–234	4,510,139
544–360	4,510,140
514–250	4,510,141
514–255	4,510,142
514–250	4,510,143
514–257	4,510,144
514–415	4,510,145
514–312	4,510,146
514–314	4,510,147
514–340	4,510,148
514–341	4,510,149
514–338	4,510,150
514–341	4,510,151
514–321	4,510,152
514–220	4,510,153
514–365	4,510,154
514–276	4,510,155
514–415	4,510,156
514–411	4,510,157
514–415	4,510,158
514–456	4,510,159
514–521	4,510,160
514–054	4,510,161
514–255	4,510,322
514–530	4,510,323

PATENTS

GRANTED APRIL 9, 1985

GENERAL AND MECHANICAL

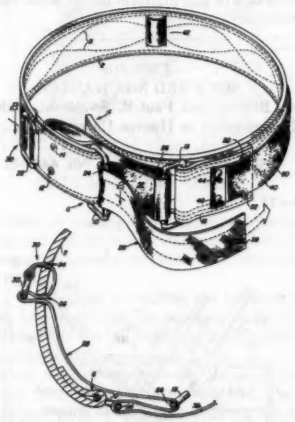
4,509,213
RAIN COVER FOR MOTORCYCLIST'S LEGS
Marc Harvey, 18, St-Cyrille, Outremont, Quebec, Canada H2V 1H8
Filed Jun. 18, 1982, Ser. No. 389,945
Claims priority, application Canada, Aug. 19, 1981, 384179
Int. Cl.³ A41D *13/02*
U.S. Cl. 2—22 **5 Claims**



1. A rain garment for motorcyclists comprising:
a body-encircling portion,
a pair of leggings depending from said body-encircling portion to cover the wearer's entire legs,
a gaiter portion at the lower end of each legging to completely cover the wearer's shoes while leaving the undersides of the shoe soles substantially completely exposed,
retaining means substantially all around the inner perimeter of the gaiter portion to secure the latter to the perimeter of the sole, said retaining means comprising an elastic strip secured to the inner perimeter of the gaiter portion at the extending below the lower edge thereof,
said elastic strip being adapted to be stretched in direct contact with substantially the entire perimeter of the sole and extending all around the perimeter of the sole,
pouch means consituting the knee-covering portion of each legging to allow free knee flexing up to 120° without disengagement of the gaiter portion from the wearer's shoes, said pouch means comprising accordeon pleats extending transversely across the front of each legging in the region of the wearer's knee and terminating at the sides of said legging,
the back of the bottom portion of each legging, including the gaiter portion and said elastic strip, being longitudinally slit and being provided with a fastener to close said slit, said slit and said fastener extending upwardly toward the back of the knee, and
attachment means to secure said garment onto said wearer.

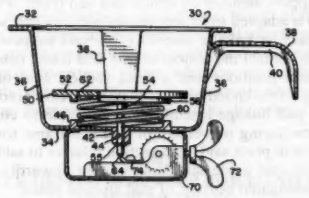
4,509,214
WEIGHT LIFTER'S BELT INCORPORATING PULLEY MECHANISM
Lance L. Shea, 2933 N. 83rd St., Scottsdale, Ariz. 85251
Filed Sep. 22, 1980, Ser. No. 189,070
Int. Cl.³ A41F *9/00*
U.S. Cl. 2—322 **10 Claims**

1. A waist belt for weight lifting, said waist belt comprising in combination:
a. a belt having first and second ends;
b. a flexible strap having a fixed end secured to said belt proximate the second end thereof, said flexible strap having a free end opposite the fixed end;
c. first means secured to said belt proximate the first end thereof for engaging said flexible strap at a first point disposed between the fixed end and free end thereof;
d. second means secured to said belt proximate the second end thereof for engaging said flexible strap at a second point disposed between the first point and the free end thereof;



e. said flexible strap, said first means, and said second means forming a pulley arrangement for tightening said belt when the free end of said flexible strap is pulled; and
f. means to secure said belt when tightened.

4,509,215
DISPOSABLE LINER FOR A MUSICAL POTTY CHAIR
Lirida Paz, 815 Summer St., Elizabeth, N.J. 07202
Filed Jun. 28, 1983, Ser. No. 508,565
Int. Cl.³ A47K *11/02;* **G08B** *21/00*
U.S. Cl. 4—452 **4 Claims**



1. In a potty chair having a seat and a receptacle removably attached thereto for receiving excrement including feces and urine, wherein said receptacle includes a bottom, an open top having an outwardly turned flange, and at least one support member, one end of which is rigidly attached to said flange and the other end of which is rigidly attached to said bottom, thereby forming a rigid basket like structure, said potty chair including a liner means for forming a liquid containing membrane within and supported by said receptacle, said liner means being constructed of thin, light-weight water impermeable material of low mass and having a bottom, a flexible side wall, and an open top having a drawstring means arranged thereabout for selectively deforming said open top into either of two positions, wherein the first position, said open top is arranged so that a portion of said side wall of said liner is turned out-

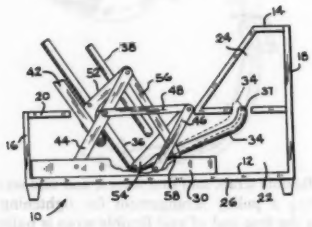
wardly over and under said flange and said drawstring means pulled snuggly to secure said portion of said side wall about said flange, and wherein the second position, said open top is arranged so that said draw string means is pulled snuggly to close said open top for disposal of said liner wherein said potty chair includes a music box means for sounding musical tones, a platform means having an upper surface arranged to undergo linear movement in an upward direction and a downward direction for actuating said music box means wherein said upper surface of said platform means is in contact with and supports the weight of said bottom of said liner means said flexible side wall being arranged so that said bottom of said liner means will move in correspondence to and along with said upper surface of said platform means while said receptacle remains stationary.

4,509,216

SOFA BED MECHANISM

Theodore J. Blevins, and Paul R. Swiderski, both of Georgetown, Ky., assignors to Hoover Universal, Inc., Ann Arbor, Mich.

Filed Nov. 29, 1982, Ser. No. 444,942
Int. Cl.³ A47C *17/04, 17/00*
U.S. Cl. 5—13 **4 Claims**



1. In a sofa bed including front, back and side frame members which define a storage space which includes a vertically elongated section adjacent said back frame member, a mechanism comprising a foldable bed frame including in succession a head section, an intermediate section and a foot section, said sections being pivotally joined at their ends and movable between a substantially coplanar horizontal bed position and a folded sofa position in which said sections are completely received within said storage space with said head section extending into the vertically elongated portion of said storage space, a support member on which said bed frame is supported and which is adapted to be secured to said sofa bed within said storage space, a linkage assembly on said support member operable to control movement of said bed frame between said bed and sofa positions and a head section control member comprising a free-ended bracket member freely pivotally supported on said linkage assembly and operable to engage said head section during movement of said bed frame toward said sofa position to pivot said head section relative to said intermediate section and guide said head section upwardly into said vertically elongated portion of said storage space.

4,509,217

GUARDRAIL ASSEMBLY FOR HOSPITAL BED

Gaston Therrien, Montreal, Canada, assignor to Bertec Inc., Montreal, Canada

Filed Apr. 4, 1983, Ser. No. 481,943
Int. Cl.³ A47C *21/08*
U.S. Cl. 5—430 **8 Claims**

1. A guardrail assembly mounted on one side of a hospital bed of the type having a bed frame including a horizontal frame part (5) and an upright bracket (17) at either end and on one side of said horizontal part, said guardrail assembly including a guardrail (18) extending along said side of sid horizontal part and means connecting the ends of said guardrail to said upright brackets (17) for allowing movement of said guardrail between a raised position, suitable to protect a bed patient from accidentally falling out of the bed, and a retracted lowered position suitable to allow the patient to move in and out of the bed, the improvement wherein said rail connection means comprises:

linkage means at both ends of said bed frame between said brackets and the ends of said guardrail for allowing movement of said guardrail between said raised and lowered positions; each linkage means comprising at least one link (23) having one end connected to one end of said guardrail and another end provided with a pin locking hole (31);

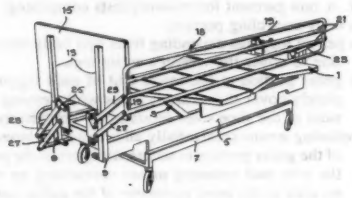
means (25) pivotally connecting said at least one link (23) intermediate its end to the upright bracket (17); said pivot means allowing swinging of said links (23) in parallel vertical planes during movement of said guardrail between said raised and lowered positions;

pin locking holes (35) provided in the upright brackets (17), said holes (35) in the brackets (17) being located so as to register with the pin locking holes (31) of the links (23) when said guardrail is in its raised position;

pin locking means (36) on said brackets, including locking pins (37) extending through said bracket locking holes (31) and resilient means biasing said pins (37) toward said locking hles (31) of said links (23) so as to move thereinto when the guardrail is in its rised position and the locking holes (31) of said in said raised position;

manual means (39) on one of said pins (37) said manual means being operable to withdraw said one pin, and

means (51) interconnecting said pin locking means (36) to



cause simultaneous engagement and disengagement of the pins (37) with the locking holes of the links (23) at both ends of the bed, whereby locking of said guardrail in raised position and at both ends of said bed may be achieved at the end only of said bed that has said manual means,

wherein each of said pin locking means (36) comprises a hollow cylindr (41) having one open end secured to the corresponding bracket (17) coaxially with the pin locking hole (35) of said bracket, said locking pin resilient means (47) being housed within said cylinder; the locking pin in said cylinder including a transverse trunnion (43) extending through and out of elongated slots (45) of said cylinder;

wherein one of said locking pins extends outwardly through the closed end of its cylinder;

wherein said manual means is a knob (39) mounted at the outwardly extending pin; and

wherein said means interconnecting said pin locking means (36) comprise: a pair of upward levers (53) each mounted on one of said brackets (17 below said cylinders, for rocking motion about a horizontal axis transverse to said bed; a horizontal elongated movement transmitting rod (59) beneath said bed and pivotally connected at the ends thereof respectively to the lower ends of said upward levers; and means pivotally mounting the upper ends of said levers (53) respectively to the ends of said trunnions (43) extending outwardly of said cylinders (41), constructed so that pulling on said knob (39) against the bias of said locking pin resilient means (47) rocks said levers

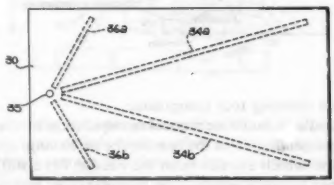
(53) through said movement transmitting rod (59) and pulls said pins (37) out of said locking holes (31) of the links (23) to release said links and guardrail for free movement between said raised and lowered positions.

4,509,218

DRAIN PIPES FOR EMPTYING WAVELESS WATERBED MATTRESSES

Albert L. Rhoton, Cypress, Calif., assignor to Morgan Flotation Systems, Los Angeles, Calif.

Filed Mar. 18, 1983, Ser. No. 476,489
Int. Cl.³ A47C *27/08*
U.S. Cl. 5—450 **10 Claims**



1. A waterbed mattress system which dampens wave motion and drains rapidly, comprising:

a sealable liquid enclosure means with at least one drain port;

wave dampening filler disposed inside said enclosure means;

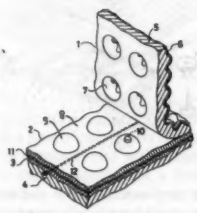
at least two perforated pipes disposed inside said enclosure means, said pipes disposed horizontally and adjacent said dampening filler, and each of said pipes having an open end disposed near said drain port and extending therefrom in a fanlike manner, whereby said pipes provide a relatively low resistance path for passing liquid contained in said enclosure means to said drain port, to be removed therefrom.

4,509,219

SLEEPING MATTRESS

Toshizo Yagi, Kodairashi, Japan, assignor to Japan Life Company Limited, Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 540,908
Int. Cl.³ A47C *27/22*
U.S. Cl. 5—481 **7 Claims**



1. A sleeping mattress comprising, in order:

a first layer made of cushion material, having a plurality of holes therein, formed with an undulated outer surface;

a second layer having semicircular projections provided with magnets, said semicircular projections being mated with said holes;

a third layer stuffed with fibers and reinforcing materials; and

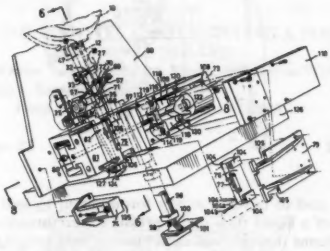
a fourth layer comprising cushion material.

4,509,220

PREVAILING TORQUE NUT

David C. Cooper, Oakville, and Kenneth J. Bouchard, Scarborough, both of Canada, assignors to Stelco Inc., Hamilton, Canada

Filed Dec. 6, 1982, Ser. No. 447,411
Int. Cl.³ B21D *53/24*
U.S. Cl. 10—86 A **17 Claims**



5. The method of making a prevailing torque nut from a regular hexagonal nut having an integral washer at one end, the nut having an internally threaded bore, the method comprising the steps:

(a) placing the regular hexagonal nut between two anvil members having oblique flat working surfaces extending over substantially the full axial height of the nut except for the integral washer,

(b) decreasing the distance between the anvil members to bring them into contact with the nut, and

(c) further decreasing the distance between the anvil members to cause an inward deformation of the nut which increases smoothly and progressively from one end of the nut to the other, the slope of the working surfaces of the jaws being such that, after inward deformation of the nut, the threads at the washer end of the nut remain substantially undeformed.

10. Apparatus for converting regular nuts into prevailing torque nuts, comprising:

two anvil members, having oblique working surfaces,

delivery means for placing the regular nuts sequentially between the anvil members,

power means for controlling the spacing between the anvil members such that (a) the anvil members first come into contact with the opposite sides of a nut located between them over substantially the full axial height of the nut, and then (b) the spacing between the anvil members decreases by a predetermined amount which is the same for all nuts within a given size range, whereby to permanently inwardly deform each nut in a smooth and progressive manner from one end of the nut to the other.

4,509,221

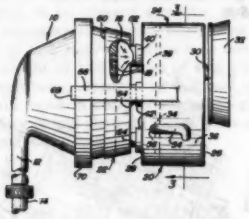
WATER DRIVEN SCRUBBER FOR HAND HELD SHOWER HEAD

Raymond A. Simpson, Jr., 609 Frontier Dr., High Point, N.C. 27263

Filed Oct. 6, 1983, Ser. No. 539,821
Int. Cl.³ A46B *13/06*
U.S. Cl. 15—29 **8 Claims**

1. In combination with a hand-held shower spray head of the type including a flexible water inlet supply hose opening into said head on one side thereof through an elongated tubular handle projecting outwardly of said one side and wherein said head includes a plurality of liquid spray jet outlets opening outwardly of a side of said head remote from said handle, a scrubber assembly attachment including a housing having first and second remote sides, said housing including rotary scrubbing means journalled therefrom and facing and disposed

outwardly of said first side, said second side including liquid inlet means, liquid motor means in said housing including a rotary output shaft upon which said scrubbing means is mounted, said housing including liquid outlet means, said motor means being operative to receive liquid under pressure from said inlet means, discharge liquid from said liquid outlet



means and to develop rotary torque input to said shaft as a result of a liquid flow under pressure therethrough from said inlet means through said outlet means, said housing and head including means operative to releasably mount said housing from said head with at least one of said spray jet outlets in sealed communication with said inlet means.

4,509,222

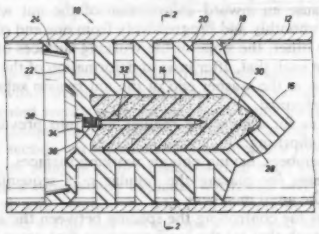
PIG FEATURING FOAM FILLED CAVITY

Kenneth M. Knapp, 1209 Hardy St., Houston, Tex. 77020

Filed Dec. 2, 1983, Ser. No. 557,370

Int. Cl.³ B08B *9/04*

U.S. Cl. 15—104.06 R **7 Claims**



1. A pipeline pig sized for placement in a pipeline flowing a fluid therealong in response to a pressure gradient acting on the fluid from an upstream location, and wherein the pig is carried with the flow of fluid in the pipeline, the pig comprising:

(a) an elongated pig body having a nose and having a centrally located hollow cavity therein of specified length and diameter;

(b) annular flexible rib means surrounding said body and extending radially outwardly therefrom to contact the inside surface of a pipeline wherein said rib means wipes the inside surface of the pipeline;

(c) a transversely extending rearwardly locating face on said body extending toward the surrounding pipe for intercepting fluid flowing in the pipeline to impart a force to the pig for moving the pig;

(d) passage means through said face into the cavity in said body, said passage means exposing said cavity to fluid in the pipeline from behind the pig; and

(e) retarding means having the form of foamed plastic in said cavity for retarding the velocity of propagation of pressure surges from behind the pig into said cavity from said passage means and wherein said retarding means enables fluid from behind the pig to impinge on the nose portion of said cavity delayed such that pressure shock waves propagated along the pipe from behind the pig are retarded by said retarding means.

4,509,223

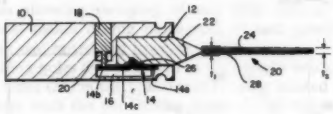
GUN CLEANING TOOL

Douglas E. Sipple, and Charles T. Wolstenholme, both of P.O. Box 65, Georgetown, Del. 19947

Filed Aug. 2, 1983, Ser. No. 519,586

Int. Cl.³ F41C *31/00*

U.S. Cl. 15—160 **16 Claims**



1. A gun cleaning tool comprising:

(a) a handle to facilitate manual manipulation by the user;

(b) a tip extending from the handle, the tip having: (i) a shank portion which extends from the handle; (ii) a stiffly resilient bar having a generally rectangular cross section defining top, bottom, and side surfaces extending from the shank portion, the resilient bar having a distal end; and (iii) cleaning means attached to at least the top and bottom surfaces and extending along the length of the bar, the distance between the exterior surfaces of the cleaning means on the top and bottom surfaces defining a thickness which decreases toward the distal end of the bar; and,

(c) latching means to removably attach the tip to the handle.

4,509,224

REFILL SPONGE MOP ASSEMBLY

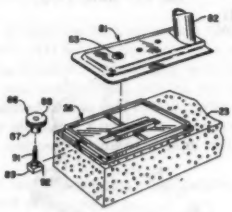
Douglas R. Batchelor, Chicago, Ill., assignor to Libman Broom Company, Arcola, Ill.

Division of Ser. No. 507,590, Jun. 24, 1983, Pat. No. 4,468,832.

This application Aug. 3, 1984, Ser. No. 637,307

Int. Cl.³ A47L *13/10*

U.S. Cl. 15—244 R **3 Claims**



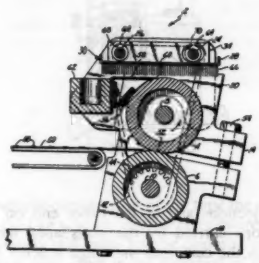
3. A refill sponge mop assembly for use with a mop head comprising a sponge, a backing plate secured to one side of said sponge, said backing plate including first connecting means thereon, an adapter having at least two sides, said adapter including second connecting means on one of said two sides and third connecting means on the other of said two sides, said first and second connecting means having mating configurations and being interengageable, and said first and third connecting means having similar constructions, and a screw and nut, said screw having a shank and a head attached to said third connecting means, and said shank and said nut being adapted to be attached to said mop head.

4,509,225

PRESSURE ROLL CLEANING SYSTEM

Orville C. Haugen, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jan. 20, 1983, Ser. No. 459,342
Int. Cl.[3] B21B *45/02*; G03G *21/00*
U.S. Cl. 15—256.51 5 Claims



1. A cleaning apparatus in combination with a moving surface and a doctor blade having a free end engaging said surface along a line to scrape and thereby clean said surface of foreign material, said cleaning apparatus comprising:

a brush having a longitudinal axis extending parallel to said line of engagement between said blade and said surface; and

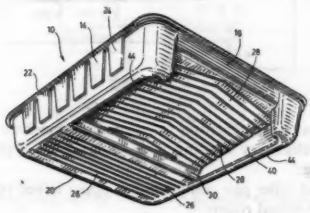
means for orbitally moving said brush into and out of contact with said surface and in a direction perpendicular to said line of engagement to force said foreign material away from said line of engagement and across said blade.

4,509,226

UNITARY PAINT TRAY

Philip J. Allison, Renforth, and Morley L. Smith, Beaconsfield, both of Canada, assignors to T. S. Simms & Co. Limited, Saint John, Canada

Filed Mar. 28, 1984, Ser. No. 594,217
Int. Cl.[3] B44D *3/12*
U.S. Cl. 15—257.06 1 Claim



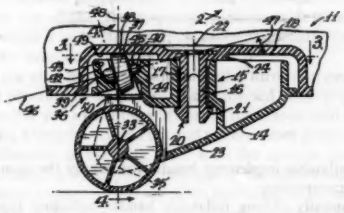
1. A nestable paint tray comprising a unitary body having a bottom wall, and a pair of oppositely disposed side walls and a pair of oppositely disposed end walls, said side and end walls having an upper edge extending in a first plane, the bottom wall being formed to provide a raised ramp which extends inwardly and downwardly from a first end wall and a paint reservoir which extends inwardly from a second end wall, said bottom wall being formed to provide a generally planar base for the tray extending inwardly from the side walls, and, said first and second end walls of the tray terminating in a second horizontal plane, said side walls extending from said first plane to said second horizontal plane along the full length thereof, said planar base comprising a generally horizontally extending first support wall formed on the underside of the paint reservoir and a pair of L-shaped second support walls projecting from said first support wall, one along the full length of each side wall of the tray to said first end wall and a short distance laterally inwardly along said first end wall, said ramp having side walls which extend downwardly to said second support walls in an oppositely disposed spaced relationship with respect to said side walls, said ramp having an inner end wall communicating with said first support wall, said side and end walls of said tray and side walls of said ramp being arranged to define an upwardly open enclosure which will accommodate a further tray of like construction in a nesting relationship.

4,509,227

THREE-PIECE SWIVEL CASTER HAVING A FORCE TRANSFER ROLLER

James W. Keane, Ramsey County, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 30, 1982, Ser. No. 429,843
Int. Cl.[3] B60B *33/00*
U.S. Cl. 16—23 7 Claims



1. In a swivel caster having a base defining a swivel portion defining a vertical swivel axis and arranged for cooperation with a complementary swivel support to permit the base to be snap-fitted to the swivel support without tools and separate fasteners to swivel about said axis of said swivel portion, and a caster wheel mounting portion defining a horizontal caster wheel axis spaced from said swivel portion axis, a caster wheel journaled in said caster wheel mounting portion for rolling movement about said caster wheel axis, the improvement comprising:

a force transfer element comprising a roller having an axis of rotation and a frustoconical periphery defining an angle of approximately 14° to said axis of rotation, axle means coaxially associated with said roller for journaling said roller on said base about a fixed rolling axis defined by said axle means, said fixed rolling axis being inclined at an angle of approximately 14° to the horizontal plane and with a lower end of the axle means being spaced further from said swivel axis than is a vertical axial plane of said caster wheel axis; and

means on said swivel support defining a planar downwardly facing bearing surface extending perpendicularly to said swivel axis and engaging said frustoconical roller periphery on a line of engagement for transmitting an overlying load from said support substantially solely vertically downwardly toward said caster wheel mounting axis, said line of engagement of the bearing surface with said frustoconical roller periphery being substantially bisected by said vertical plane of the caster wheel axis, said axle means and roller being cooperatively constructed to permit installation of the roller on said base with the frustoconical periphery narrowing in only one preselected axial direction, said axle means including an upper end projecting from said roller coaxially oppositely to said lower end, said lower end of the axial means defining a substantially hemispherical bearing having a radius substantially greater than the diameter of said upper end, the extension of said lower end of the axle means from said roller being less than twice said radius, said base having an upstanding wall forming a pair of spaced axle supports defining com-

plementary lower and upper axle supporting portions and being open downwardly toward said caster wheel intermediate said axle supporting portions, said roller being maintained spaced from said lower axle supports by the engagement of the lower axle means end with said lower axle supporting portion, said caster comprising a three-piece structure formed of synthetic resin.

4,509,228

INFLATABLE IMPLEMENT HANDLE

Kurt Landsberger, 103 Harrison St., Verona, N.J. 07044

Filed Mar. 4, 1983, Ser. No. 472,046

Int. Cl.³ B25G *1/00*

U.S. Cl. 16—114 R **6 Claims**

1. An inflatable implement handle for use by the manually impaired, comprising:

a substantially oblong inflatable handle including top and bottom walls circumferentially joined together and front and rear walls separating the top and bottom walls and circumferentially joined thereto;

the front and rear walls being continuous walls, with the front wall having upper and lower sections extending longitudinally within the handle to provide a longitudinally extending internal pocket substantially in the center of the front wall;

the upper and lower sections of the front wall being laterally ard longitudinally joined on either side of the pocket;

valve means arranged with one of the top and bottom walls and operable for permitting the handle to be inflated to a degree of resiliency commensurate with the manual impairment of a user, and for being deflated;

an implement interchangeably received in the pocket before the handle is inflated;

a force being exerted on the pocket for retaining the implement therein when the handle is inflated; and

the force being relieved for releasing the implement from the pocket when the handle is deflated.

4,509,229

CONCEALED HINGE HAVING A SPRING BIASED U-SHAPED SLIDER

Luciano Salice, Carimate, Italy, assignor to Arturo Salice, S.p.A., Novedrate, Italy

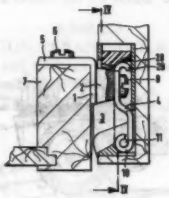
Filed Mar. 2, 1984, Ser. No. 585,447

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1983, 3307777

Int. Cl.³ E05D *11/10*

U.S. Cl. 16—327 **4 Claims**

1. A concealed hinge assembly, comprising a mounting plate, a projecting base member, which is connected to the mounting plate, a hinge bracket, which adjacent to its one end is screw-connected to the mounting plate and at its other end is hinged to one side of a pot-shaped member in such a manner that the one end on the hinge bracket moves into the pot-shaped member during closing movement, and a slider, which is guided in the pot-shaped member in a radial plane and biased by two mutually parallel coiled compression springs and carries a cam, which during the closing movement cooperates with a projection of the hinge bracket, characterized in that the slider is U-shaped and comprises a crosspiece and side legs, which are guided in mating recesses of the pot-shaped member and at their free ends are provided with inwardly directed, angled projections, the compression springs bear at one end on



said angled projections and at the other end on abutments consisting of stops carried by the pot-shaped member, the crosspiece carries the cam, and the hinge bracket has an end portion which extends beyond the projecting base member and runs up and slides along said cam.

4,509,230

DRAFTING MECHANISM FOR A SPINNING MACHINE

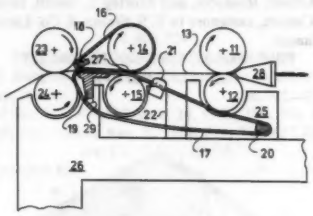
Arthur Wuermli, Winterthur, Switzerland, assignor to Rieter Machine Works Ltd., Winterthur, Switzerland

Filed Jun. 29, 1983, Ser. No. 509,235

Claims priority, application Switzerland, Jul. 23, 1982, 4503/82

Int. Cl.³ D01H *5/64*

U.S. Cl. 19—245 **9 Claims**



1. A drafting mechanism for a spinning machine provided with a preliminary drafting zone and a main drafting zone comprising:

an infeed roller pair comprising an upper infeed roller and a lower infeed roller;

a delivery roller pair comprising an upper delivery roller and a lower delivery roller;

an apron roller pair comprising an upper apron roller and a lower apron roller;

an upper apron and a lower apron driven by said apron roller pair;

the preliminary drafting zone extending between the infeed roller pair and a nip line formed by the apron rollers which are pressed against the upper and lower aprons;

the main drafting zone extending between said nip line and the delivery roller pair;

said lower apron extending beneath the preliminary drafting zone and the lower infeed roller; and

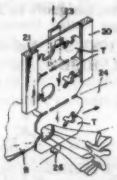
the lower apron being in grazing contact with said lower infeed roller during operation of the drafting mechanism in order to clean the lower infeed roller of fibers.

4,509,231

DUAL-OPENING BAG CLOSURE

Jerre H. Paxton, 2720 S. 16th Ave., Yakima, Wash. 98903

Filed May 27, 1983, Ser. No. 498,967
Int. Cl.³ B65D 77/10
U.S. Cl. 24—30.5 R 5 Claims



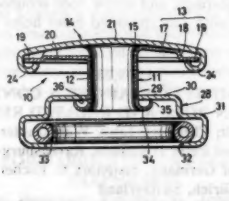
1. In a multiple-closure strip of the type for closing the neck of a bag or the like wherein each of the closures includes a flat, thin, transversely stiff body having opposite ends terminating in longitudinal side edges in the direction of the length of the strip, frangible means connecting the closures in said strip so as to cause at least one of said opposite longitudinal side edges of the terminal closure in the strip adapted to be exposed for contact with a bag neck to be closed, each of said opposite longitudinal side edges having an opening terminating in a bag neck-receiving aperture, with the bag neck-receiving aperture at one end of the closure being different from the bag neck-receiving aperture at the opposite end, whereby bags of various sizes or materials can be closed, with said closure dependent upon which side edge is exposed to the bag.

4,509,232

ATTACHING POST FOR SNAP FASTENER ELEMENTS

Yoshihiro Kanzaka, Nyuzen, Japan, assignor to Nippon Notion Kogyo Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1983, Ser. No. 517,897
Claims priority, application Japan, Aug. 2, 1982, 57-117499
Int. Cl.³ A44B 1/42
U.S. Cl. 24—113 R 3 Claims



1. An attaching device for a snap fastener element, comprising:

(a) a post including a cylindrical stem and a circular flange integral therewith and extending from an end of said stem;

(b) a cap mounted on said flange and including a rounded circular wall and an annular curled rim integral with and extending axially from said rounded wall and having an end;

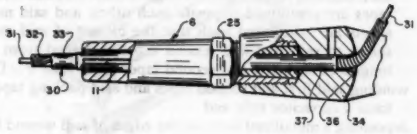
(c) said circular flange including a central portion contiguous to said end of said stem, an inclined annular step extending radially outwardly from said central portion, an annular shoulder extending radially outwardly from said annular step, and a plurality of radial ribs integral with said past and extending radially outwardly from said end of said stem to said annular step, said end of said stem being spaced from said rounded wall of said cap, and said annular shoulder being locked in position by said end of said annular rim.

4,509,233

ROPE CLAMP CONSTRUCTION

Charles R. Shaw, Twinsburg, Ohio, assignor to Esmet, Inc., Canton, Ohio

Filed Jun. 15, 1983, Ser. No. 504,625
Int. Cl.³ F16G 11/00; H02G 15/08
U.S. Cl. 24—136 R 22 Claims



1. An improved rope clamp construction including:

(a) an elongated sleeve having first and second ends and formed with an internal tapered bore converging toward the second end;

(b) a tapered plug slidably mounted within the tapered bore of the sleeve for gripping a nonmetallic fibrous rope within a bore formed in an extending axially throughout the length of the plug;

(c) the plug having an annular collar formed at one end and a plurality of tapered segments formed integrally with the collar and extending outwardly therefrom, said plug having a length between ten and twenty times greater than the diameter of the plug bore, with the annular collar being located toward the second end of the sleeve and with the taper of the tapered segments extending in the same direction as the taper of the internal tapered bore of said sleeve;

(d) a friction reducing, corrosive resistant coating on the plug and on the internal bore of the sleeve to facilitate the sliding movement of the plug within the sleeve bore; and

(e) attachment means removably mounted on the first end of the sleeve for attaching the sleeve and internally mounted plug to a termination structure.

4,509,234

AUTO-REGENERABLE CAPACITOR AND METHOD OF MANUFACTURE THEREOF

Franz Voglaire, Rue Bois des Collines No. 15, Braine - l'Alleud, Belgium

Filed Oct. 20, 1983, Ser. No. 543,931
Claims priority, application European Pat. Off., Oct. 20, 1982, 82870056.7; Feb. 4, 1983, 83200184.6
Int. Cl.³ H01G 7/00, 4/24
U.S. Cl. 29—25.42 11 Claims

1. A method of manufacturing an auto-regenerable capacitor, comprising the steps of:

providing a first tape made from dielectric material metallized on one side except for one edge;

providing a second tape, said second tape being similar to

said first tape and being made from dielectric material metallized on one side except for one edge;

provided a non-metallized packing tape having at least two metal sheets thereon, each metal sheet having a length of at least $\pi \times D$ and each metal sheet being spaced apart from the next adjacent metal sheet by at least $\pi \times D$;

arranging said first and second tapes and said packing tape such that said non-metallized edges of said first and second tapes are positioned opposite each other, and said metal sheets are positioned such that the closest of said metal sheets to said first and second tapes is spaced from the longest of said first and second tapes by at least $\pi \times D$;

winding said first and second tapes and said packing tape to form a capacitor roll; and

depositing a metallized layer on the edges of said wound first and second tapes as well as the edges of said packing tape to form contacts for said capacitor roll;

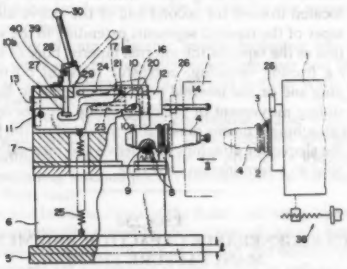
wherein D is the diameter of said capacitor roll.

4,509,235

TOOL CHANGER

Shinichiro Sakamoto, Kariya, Japan, assignor to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 4, 1982, Ser. No. 405,085
Claims priority, application Japan, Sep. 9, 1981, 56-141094
Int. Cl.³ B23Q *3/157*
U.S. Cl. 29—26 A **8 Claims**



1. A tool changer comprising:

a machining unit having a tool spindle for clamping a tool therein and including means for releasing said tool therefrom;

a pallet movable toward a station in front of said machining unit;

support means on said pallet for releasably supporting the tool in substantial alignment with said tool spindle;

a feed actuator for displacing said machining unit toward and away from said support means to allow said tool spindle to receive the tool or release the same onto said support means;

means for displacing said pallet in a direction transverse to the direction in which said machining unit is displaceable so as to allow said support means to release the tool onto or receive the same from said tool spindle when said machining unit completes its displacement toward said support means; and

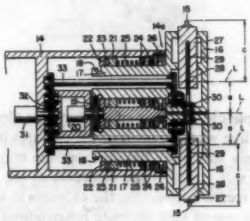
a tool clamp mounted on said pallet for releasably clamping the tool on said support means, said tool clamp being mechanically responsive to the displacement of said machining unit toward said support means for releasing the tool on said support means wherein said tool clamp further comprises a clamp frame mounted on said pallet, a horizontally extending clamp arm vertically pivotably mounted on said clamp frame for releasably holding the tool on said support means, and a clamp actuation mechanism operatively mounted on said clamp frame and mechanically responsive to the displacement of said machining unit towards said support means for vertically moving said clamp arm to release the tool.

4,509,236

BORING MACHINES

Seiichiro Morita; Akihiko Yuasa, both of Numazu, and Takao Arai, Mishima, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 10, 1983, Ser. No. 456,548
Int. Cl.³ B23B *39/00*
U.S. Cl. 29—26 A **1 Claim**



1. In a hollow rotary spindle of a boring machine provided with a pair of swing arms attached to the front end of the rotary spindle and adapted to support cutters and also provided with a driving mechanism disposed within the rotary spindle for driving the swing arm, the improvement in which said pair of swing arms extend in symmetric radial directions with respect to said rotary spindle and are rotated about the axis thereof and a pair of rams are disposed respectively within said swing arms to be movable in radial directions of said swing arm so as to extend beyond the front ends thereof, said cutters being secured at the front ends of said rams, said rotary spindle being further provided therein with a driving mechanism for driving said rams, said ram being further provided with threaded holes extending in the longitudinal direction, and said ram driving mechanism comprising an electric motor disposed within said rotary spindle, a gear mounted on a drive shaft of said motor, rotary shafts provided with rear gears meshed with said gears, bevel gears operatively connected to said rotary shafts through gearings, and screw rods secured to said bevel gears to engage with said threaded inner holes of said rams.

4,509,237

ARRANGEMENT CONTAINING A CONTROLLED DEFLECTION ROLL AND RELATED REGULATOR

Karl Volz, Baindt; Christoph Link; Wolf-Gunter Stotz, both of Ravensburg, and Peter Heitmann, Ravensburg-Oberhofen, all of Fed. Rep. of Germany, assignors to Escher Wyss Aktiengesellschaft, Zürich, Switzerland

Filed Apr. 26, 1982, Ser. No. 372,011
Claims priority, application Fed. Rep. of Germany, May 2, 1981, 3117398
Int. Cl.³ B21B *13/14*
U.S. Cl. 29—116 AD **6 Claims**

1. An arrangement comprising:

a controlled deflection roll;

said controlled deflection roll comprising a roll shell having opposed ends and a roll support;

support elements for supporting said roll shell upon said roll support;

a regulation arrangement for regulating a position of the roll shell;

means for operatively connecting said regulation arrangement with said support elements;

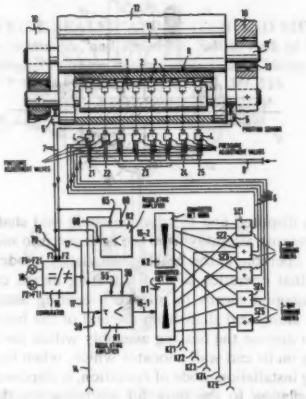
position sensors for detecting the position of the roll shell at least at said opposed ends thereof and cooperating with said regulation arrangement;

the regulation arrangement serving for processing two refer-

ence value-actual value differences of the position of the roll shell into two adjustment magnitudes operatively acting upon said support elements;

the regulation arrangement containing circuit means for forming both of said two adjustment magnitudes, while taking into account a possible difference between both of said two reference value-actual value differences and for thereafter transforming the same into a plurality of weighted adjustment values and summing them together with further such adjustment values, and inputting such summed adjustment values to the support elements;

said circuit means of said regulation arrangement containing at least two regulation circuits possessing regulation time-



constants for defining a response time—delay of said at least two regulation circuits;

said circuit means of said regulation arrangement further containing time-constant altering means which alter said regulation time-constant of at least one of said two regulation circuits when there are present different reference value-actual value differences of the roll shell; both of said two regulation circuits possessing relatively high regulation time-constants when there are present two substantially equal reference value-actual value differences; and

the regulation time-constant of at least one of the two regulation circuits being reduced by said time-constant altering means when there are present two substantially different reference value-actual value differences.

4,509,238

METHOD FOR FABRICATING A STEAM TURBINE DIAPHRAGM

Lester H. Lee, Braintree; Kathryn M. Johnson, Salem, and Richard W. Jones, Melrose, all of Mass., assignors to General Electric Company, Lynn, Mass.

Filed Mar. 21, 1983, Ser. No. 477,345
Int. Cl.³ B21K *3/04*
U.S. Cl. 29—156.8 R **2 Claims**

1. A method for making a turbine diaphragm comprising the steps of:

forming two 360 degree bands of different diameters;

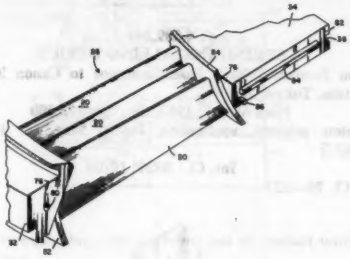
cutting a plurality of slots in each of the bands for accepting opposite ends of blades;

placing the bands into concentric alignment with one another to define an inner and outer band and welding inner and outer blade ends each into respective inner and outer band slots;

severing both said inner and outer bands at two locations approximately 180 degrees apart using first and second line cuts spaced between adjacent blades;

forming a pair of 180 degree inner and outer half rings, each ring having generally planar mating surfaces at opposite ends; and,

welding the pair of inner and outer half rings to the inner and



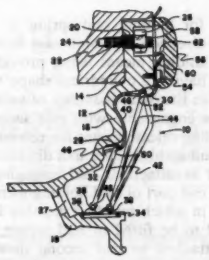
outer bands respectively whereby the line cuts between adjacent blades and the planar mating surfaces of inner and outer half rings at each location are not aligned in the same radial plane.

4,509,239

METHOD OF FORMING A WHEEL

John V. Liggett, Plymouth, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Dec. 27, 1983, Ser. No. 565,544
Int. Cl.³ B21D *53/32*
U.S. Cl. 29—159 A **5 Claims**



1. A method of forming a wheel having a plurality of ornamental spoke elements on an outer side thereof comprising the steps of:

providing said wheel with a mounting hub and a radial wall portion extending therefrom and terminating at a tire-receiving rim, said radial wall portion having a cross-sectional contour including at least one generally axially extending, radially outwardly facing surface on said outer side located radially between said hub and said rim;

forming a radially inwardly opened circumferential groove on said outer side of said rim;

forming a hub plate to overlie at least a portion of said wall portion with edge portions thereof being located radially outwardly of said axially extending surface;

forming said plurality of said spoke elements with a hub end and a rim end;

forming a cylindrical element with a plurality of openings therein, which said openings are each capable of receiving said rim end of one of said spoke elements;

installing said cylindrical element within said circumferential groove;

installing said spoke elements with said rim ends in corresponding said openings in said cylindrical element and said hub ends resting against said axially extending surface;

installing said hub plate over said wall portion with said edge portions thereof entrapping said hub ends of said spoke elements against said axially extending surface; and securing said hub plate to said wheel.

4,509,240

SPRING INSTALLING DEVICE

Nobuo Tezuka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed May 5, 1982, Ser. No. 375,300

Claims priority, application Japan, May 14, 1981, 56-69556[U]

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—227 **5 Claims**

1. A device for installing a spring having a first arm and a second arm adapted to develop a resilient force between a first member and a second member by having said first arm of said spring engaged with said first member and by having said second arm of said spring engaged with said second member, comprising:

holding means for holding said spring in freely movable relation in a direction in which said first member is attached, said holding means being provided at said first member and having a cylindrical shape with a diameter almost equal to the outer diameter of said spring;

engaging means engageable with said second arm of said spring, including release means for releasing said engagement when said spring moves to a direction in which said first member is attached, said engaging means being formed as an end part of said holding member along with the direction in which said first member is attached, and

a shaft adapted to be fitted in said spring when said first member is attached to said second member, said shaft consisting of a portion having a smaller diameter than the inner diameter of said spring and a portion having a larger diameter than the inner diameter of said spring, said shaft being fixed to said second member.

4,509,241

COMBINATION BEARING REMOVAL AND INSTALLATION TOOL

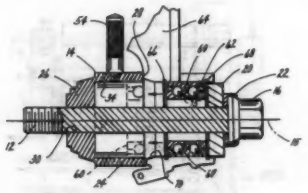
John A. Freeland, 6901 Scio Church Rd., and Robert D. Freeland, 907 Sunnyside, both of Ann Arbor, Mich. 48103

Filed Apr. 9, 1984, Ser. No. 597,886

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—263 **20 Claims**

1. A combination bearing removal and installation tool adapted for use in removing and installing an annular bearing assembly from and in a spindle-receiving bore of a vehicle wheel spindle supporting system without the need to disassemble the wheel spindle supporting system from the vehicle, said tool comprising a shaft having a thread and a cup coaxial with said shaft, said cup having a sidewall open at one axial end and an end wall at the opposite axial end, said end wall having a threaded hole via which said cup threads coaxially onto said shaft, actuating means for rotating said shaft relative to said cup, and bearing engaging means operable by said actuating means for advancing a bearing assembly toward said cup when the tool is in use, said cup being reversible on said shaft by unthreading the cup from the shaft, reversing the cup and then rethreading it onto the shaft, such reversibility endowing the tool with respective bearing removal and bearing installation modes of operation, said bearing removal mode of operation being characterized by said cup being disposed at an end of the spindle-receiving bore with its open axial end facing toward the bore, and said bearing installation mode of operation being characterized by the end wall of said cup facing toward the bore, the tool being operable in the bearing removal mode of operation such that operation of said actuating means causes said bearing engaging means to engage a bearing assembly in the bore from the end of the bore opposite the end at which



said cup is disposed and to advance along said shaft and displace the bearing assembly from the bore and into said cup, the tool being operable in the bearing installation mode of operation such that operation of said actuating means causes said bearing engaging means to engage a bearing assembly and advance it along said shaft from the end of the bore opposite said cup to dispose the bearing assembly within the bore, said cup having on its end wall a locator which, when the tool is in the bearing installation mode of operation, is disposed in predetermined relation to the bore for abutment by the bearing assembly being installed thereby to accurately locate same in a desired installation position within the bore.

4,509,242

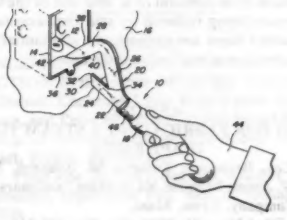
TOOL FOR QUICK REMOVAL OF KNOCK-OUT PLUGS

Gerardo J. Marra, 175 Cherry La., River Edge, N.J. 07661

Filed Jun. 10, 1983, Ser. No. 503,242

Int. Cl.³ B23P *19/04*

U.S. Cl. 29—267 **5 Claims**



1. A tool for quick removal of knock-out blocks in an electrical box within a wall which comprises:

(a) an elongated insulated handle; and

(b) a triangular shaped prying blade hook for prying out the knock out plugs from the electrical box said hook affixed to said handle, and wherein said hook comprises:

(1) a flat shank portion that is secured to said handle;

(2) a piercing blade portion having a beveled forward end forming a top point, said piercing blade portion extending outwardly from said flat shank portion to pierce the wall adjacent the electrical box;

(3) an arm portion extending outwardly at an angle from the top of said piercing blade portion, the junction between said arm portion and said piercing blade portion forming a

pivot point therebetween to engage a front edge of the electrical box; and

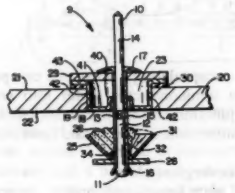
(4) an engaging blade portion having curved outer and inner edges thus forming a tip end, said engaging blade portion extending outwardly and downwardly at an angle from the arm portion and forming a triangular configuration, the tip end being spaced from the top point and lying in a longitudinal plane below the longitudinal plane of the upper edge of said piercing blade which top edge includes said top point, whereby the tip end of said engaging plane will knock out a plug in the electrical box when said handle is pivoted against the electrical box.

4,509,243

BLIND SIDE SEALER APPARATUS AND METHOD

William R. Schneider, and Robert B. Smith, both of Columbus, Ohio, assignors to Gas Research Institute, Chicago, Ill.

Filed Feb. 8, 1982, Ser. No. 346,516
Int. Cl.³ F16L *55/16*; B23P *7/04*
U.S. Cl. 29—402.02 **12 Claims**



1. An apparatus for the blind sealing of leaks through the wall of a vessel from inside the vessel to outside the vessel, comprising:

a. a stem having in sequential spaced relation an enlarged head portion, a neck portion of reduced size and an extension portion;

b. a sleeve member coaxially surrounding the stem in juxtaposition to acommodate and surround the head portion, and having a collar means portion at the end opposite to the head portion of the stem;

c. a guide means encircling the sleeve member, constructed to loosely fit in a preformed aperture in the wall of the vessel to position the apparatus;

d. an expandable capping means encircling the sleeve member between the head surrounding portion and the guide means; and

e. a viscous caulking sealant interposed between the capping means, the guide means, and the vessel.

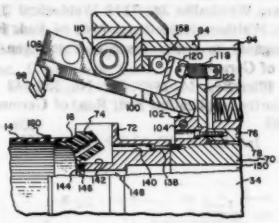
4,509,244

AIR SPRING ASSEMBLY APPARATUS AND METHOD

Richard C. Houck, Clinton, and Dennis A. Lundell, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 437,146, Oct. 27, 1982, Pat. No. 4,471,520. This application Apr. 25, 1984, Ser. No. 603,677
Int. Cl.³ B21D *39/00*
U.S. Cl. 29—516 **4 Claims**

1. A method of assembling a tubular member with an end fitting inserted in an open end of the tubular member and held in place by crimping a ring member around the open end of the tubular member over said fitting comprising placing said ring member over the end of said tubular member, inserting said end fitting into the open end of said tubular member, contracting segments of an annular segmental clamping member to positions on the surface of said tubular member for clamping engagement with said ring member, axially moving said segments to move ring member toward end to predetermined position for crimping increasing the clamping force exerted by said clamping member to crimp said ring member and thereafter radially expanding said segments out of contact with said ring member.

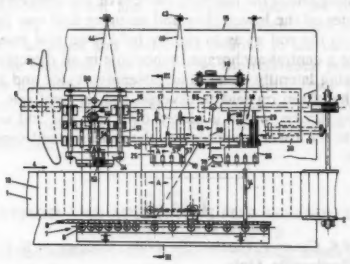


4,509,245

APPARATUS FOR SECURING PARTS ON ELONGATED WRITING INSTRUMENTS, IN PARTICULAR FOR SECURING AN ERASER FOR A SHEATH RECEIVING IT ON A PENCIL

Walter Barth, Nuremberg, and Harald H. Kremser, Postbauer-Heng, both of Fed. Rep. of Germany, assignors to Bleistiftmaschinenfabrik Dipl. Ing. Karl Zuber GmbH & Co. KG, Nuremberg, Fed. Rep. of Germany

Filed Apr. 14, 1983, Ser. No. 484,866
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214994
Int. Cl.³ B23P *19/02*
U.S. Cl. 29—525 **19 Claims**



1. In an apparatus for attaching parts, such as erasers and/or sheaths for holding the erasers, on the ends of elongated writing instruments, the improvement comprising:

a linear conveyor device for carrying sets of writing instruments through said apparatus, said conveyor device defining means for supporting said writing instruments normal to the direction of movement of said conveyor device and parallel to, and equidistantly spaced apart from, one another:

means for feeding said supplied parts toward said conveyor device, said supplying means being coupled to said feeding means at said location, each said feeding means including means for pushing said parts onto said writing instruments and menas for moving said feeding means parallel to, adjacent and at the same rate as said conveyor device;

whereby as said conveyor device carries said writing instruments to said feeding means, and when said writing instruments register with said supplied parts, said feeding means first moves from said location in the same direction as said conveyor device while said parts as pushed onto said writing instruments, and then moves in the reciprocal direction back to said location whereupon said supplying means again supplied parts to said feeding means.

4,509,246

METHOD AND A DEVICE FOR SECURING DOUBLE-WALL PANELS TO SUBSTRUCTURES

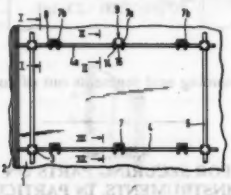
Artur Fischer, Weinhalde 34, 7244 Waldachtal 3/Tumlingen, and Horst Walther, Heidelberg, both of Fed. Rep. of Germany, assignors to Artur Fischer, Tumlingen/Waldachtal, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,442

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1982, 3234188

Int. Cl.³ B23D *19/00*; E04B *5/52*

U.S. Cl. 29—526 R 4 Claims



1. A method of securing double-wall panels, each being formed by an upper cover plate and a lower plate spaced from each other and connected to each other by parallel cross-pieces to form hollow chambers, to a substructure having transversal rods by means of a plurality of fastening devices, each including a hook-shaped anchor insertable into at least one hole in the lower cover plate of the panel and a U-shaped clamping member connectable to the anchor and adapted to be placed over the respective rod for securing the lower cover plate of the panel to the respective transversal rod, the method comprising positioning one of the fastening devices on the transversl rod in the center of the lower plate and securing said one fastening device to the rod so as to rigidly hold it on said one rod to produce a central anchorage immovable in all directions, and positioning laterally of said one fastening device and at a distance therefrom on said transversal rod, at least one further fastening device, which is placed over said one rod and connected to the lower cover plate of the panel in a self-supporting manner.

4,509,247

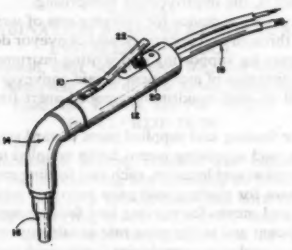
MIG WELDING GUN

Michael S. Conover, Bartlesville, Okla., assignor to K. C. Welding, Bartlesville, Okla.

Filed Dec. 15, 1980, Ser. No. 216,159

Int. Cl.³ B22D *11/126*; B22C *9/02*

U.S. Cl. 29—527.4 2 Claims



1. A method of manufacturing an outer housing for a MIG welding gun and comprising the steps of molding the housing by an investment casting process to provide an unitary structure having an integral internally threaded portion for threadedly receiving a nozzle therein, sand blasting the housing subsequent to the investment casting process, and painting the housing with a suitable heat resistant paint subsequent to the sand blasting operation.

4,509,248

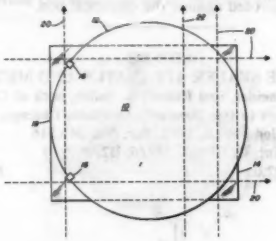
ENCAPSULATION OF SOLAR CELLS

Mark B. Spitzer, Lexington, and Roger G. Little, Bedford, both of Mass., assignors to Spire Corporation, Bedford, Mass.

Filed Mar. 4, 1982, Ser. No. 354,808

Int. Cl.³ H01L *31/18*

U.S. Cl. 29—572 20 Claims



1. A process of encapsulating a solar cell comprising:
(a) processing a semiconductor wafer into an uncut cell having a p-n junction and front and back contacts;
(b) securing an interconnect strip to said front contact of said cell;
(c) providing a coverglass plate;
(d) bonding said plate to said cell; and
(e) cutting the bonded assembly of plate and cell to size.

4,509,249

METHOD FOR FABRICATING ISOLATION REGION IN SEMICONDUCTOR DEVICES

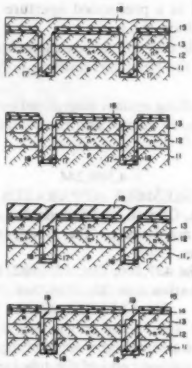
Hiroshi Goto, Yokohama, and Akira Tabata, Zama, both of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Sep. 23, 1983, Ser. No. 535,342

Claims priority, application Japan, Sep. 29, 1982, 57-171977

Int. Cl.³ H01L *21/205*

U.S. Cl. 29—576 W 18 Claims



1. A method for fabricating an isolation region in a semiconductor device formed with a semiconductor substrate having a U-shaped isolation groove, comprising:
coating said isolation groove with a first insulating layer;
filling the coated groove with polycrystalline semiconductor material at least to a first depth below the surface of said substrate; and

depositing a second insulating layer on said polycrystalline semiconductor material so as to at least fill said isolation groove up to said substrate surface.

4,509,250

PROCESS FOR MANUFACTURING A MONOLITHIC INTEGRATED CIRCUIT COMPRISING AT LEAST ONE BIPOLAR PLANAR TRANSISTOR

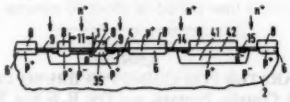
Lothar Blossfeld, Freiburg, Fed. Rep. of Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed Sep. 9, 1983, Ser. No. 530,526

Claims priority, application European Pat. Off., Sep. 20, 1982, 82108669.1

Int. Cl.³ H01L *21/98, 21/223, 21/265*

U.S. Cl. 29—578 **4 Claims**



1. A process for manufacturing a monolithic integrated circuit comprising at least one bipolar vertical planar transistor whose emitter region is formed in one surface of a semiconducting substrate into a base region which is diffused into a collector region, said process employing a first photoresist mask to produce a diffusion masking layer whereby a collector area is restricted, dopings of a conductivity type of the collector region being implanted and diffused into said collector area;

then employing a second photoresist mask, such that a base area is restricted and dopings of an base region are implanted;

thereafter implanting the dopings of the emitter region into the emitter area; and

employing a third photoresist mask to produce, contact holes in an insulated layer covering the surface side, and a fourth mask to produce an interconnection pattern on the insulating layer contacting the regions, characterized by the following processing steps:

(a) employing said first photoresist mask to produce a diffusion masking layer on the surface side of the substrate which leaves the base area on the substrate unmasked; thereafter

(b) introducing and diffusing the doping material of the collector region into the semiconductor surface within the base area, and subsequently introducing the doping material of the base region in a first relatively small dose into the semiconductor surface by way of ion implantation and by employing the diffusion masking layer as the implantation masking; thereafter

(c) removing the diffusion masking layer and employing a second photoresist mask to produce an oxidation masking layer on the semiconductor surface, said oxidation masking layer covering both the emitter area and the base rim portion in a frame-shaped manner; thereafter

(d) by employing the oxidation masking layer as an implantation mask, implanting ions of the base region type into the exposed semiconductor surface with a second relatively high dose rate, and subsequently thereto, thermal oxidizing the exposed semiconductor surface by forming a new implantation mask, in the course of which the implanted ions are activated; and

(e) opening contact holes by employing a third photoresist mask and producing an interconnection pattern by employing a fourth photoresist mask.

4,509,251

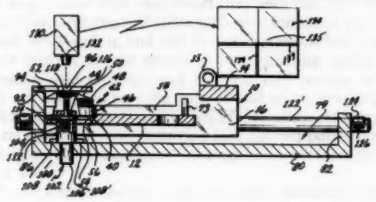
APPARATUS AND METHOD FOR ORIENTING A MAGNETIC GAP IN A SLIDER HEAD IN A CARRIAGE

Ko K. Gyi, Thousand Oaks, and Gurbachan S. Grewal, Sepulveda, both of Calif., assignors to Magnetic Information Technology, Inc., Chatsworth, Calif.

Filed Sep. 29, 1982, Ser. No. 426,883

Int. Cl.³ G11B *5/42*

U.S. Cl. 29—603 **16 Claims**



1. As an article of manufacture, an apparatus for assembling a carrier member and a magnetic slider head in a carriage which is a component of a magnetic recording apparatus and for orienting the gap of the magnetic slider head in the carrier member relative to the carriage, in combination, fixture means for holding the carriage with the carrying member and the magnetic slider head mounted on the carriage in a position in which the carrier member is relatively movable, means establishing a fixed reference point in a position relative to the gap in the magnetic slider head wherein the relative positions of the fixed reference point and the magnetic slider are observed whereby the carrier member and the magnetic slider head are manually adjusted and positioned relative to the carriage to orient the magnetic gap relative to the reference point such that the magnetic gap is oriented in azimuth, track to track orientation and is indexed relative to the carriage and whereby the carrier member can be bonded to the carriage in the oriented position.

4,509,252

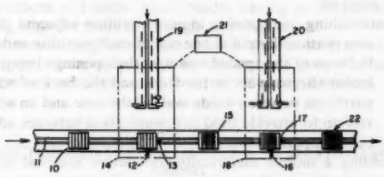
METHOD AND APPARATUS FOR ASSEMBLING BATTERY COMPONENTS

Anthony Sabatino, St. Paul; Eugene F. Stanefski, South St. Paul; Ronald N. Romanchuk, Fridley, and Edward G. Schaumburg, Askov, all of Minn., assignors to GNB Batteries Inc., Mendota Heights, Minn.

Filed Jul. 6, 1982, Ser. No. 395,686

Int. Cl.³ H01M *6/04;* **B23P** *19/04*

U.S. Cl. 29—623.1 **70 Claims**



1. Apparatus for assembling battery components including a battery case having at least one divider wall defining a plurality of cell spaces opening through a top portion of the case, and a plurality of separate individual cell elements having electrical connecting means, said apparatus comprising:

means for positioning a battery case at at least one insert station with the top portion uppermost;

means for picking up a plurality of said separate cell elements;

means for moving the cell elements picked up by said means for picking up cell elements to separate aligned positions over predesignated cell spaces with said electrical connecting means uppermost; and

means for concurrently inserting the picked-up separate cell elements into said predesignated cell spaces to provide said cell elements in said spaces with a polarity arrangement for making series connections of the cell elements between said connecting means thereof.

4,509,253

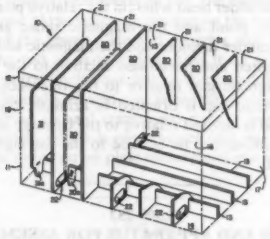
METHOD FOR MANUFACTURE OF A STORAGE BATTERY

Kelly L. Eberle, 738 Northern Rd., S. Daytona, Fla. 32019

Continuation-in-part of Ser. No. 369,054, Apr. 16, 1982, abandoned. This application May 25, 1984, Ser. No. 614,367

Int. Cl.[3] H01M 6/00

U.S. Cl. 29—623.1 13 Claims



1. A method for manufacture of a storage battery of the type including a one piece case integral below the acid level of the battery having spaced partitions extending upward from the bottom of the case which define with walls of the case a plurality of liquid tight cell compartments, and spaced rest ups extending respectively from the bottom of the case and tranversely to the partitions to provide means for supporting lugged positive and negative plates of the battery comprising the steps of:

establishing one opening in each partition adjacent the bottom portion thereof at one end of each partition and below the tops of the spaced rest ups, the openings being established alternatively at the front and the back of adjacent partitions between a side wall of the case and an adjacent rest up to provide fluid communication between adjacent cell compartments;

adding a mobile electrically-conductive material into the ends of said cell compartments to a level below the tops of the rest ups and at least to the height of the openings for flow through said openings to establish beds of conductive material between adjacent cell compartments; and

placing a stack of battery plates in each cell compartment and locating lugs of the plates in the beds of conductive material, the lugs of the negative plates being at one end of a cell compartment and the lugs of the positive plates being at an opposite end of that cell compartment.

4,509,254

METHOD FOR MOLYBDENUM-COATED ALUMINUM CURRENT COLLECTOR FOR ALKALI METAL/SULFUR BATTERY CELLS

Paul A. Damrow, Concord, and Floris Y. Tsang, Walnut Creek, both of Calif., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 494,595, May 13, 1983, Pat. No. 4,460,662. This application Mar. 5, 1984, Ser. No. 586,461

Int. Cl.[3] H01M 6/00

U.S. Cl. 29—623.5 7 Claims

1. The method of making a cathodic current collector for an alkali metal/sulfur cell which comprises:

(1) providing a shaped article having an outer layer, at least 150Å thick, of molybdenum or of a predominantly molybdenum, aluminum/molybdenum mixture, on a substrate of aluminum or of a predominantly aluminum, aluminum/-molybdenum mixture, and

(2) contacting said layer with oxygen molecules, at a temperature above 50° C. but below the melting point of aluminum for a time period of about 10 minutes or longer.

4,509,255

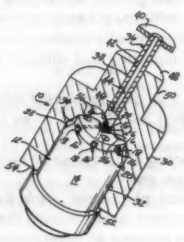
APPARATUS FOR CRIMPING BRUSH CONTACTS

Samuel J. Costello, Nineveh, and Eric R. Sohne, Hartwick, both of N.Y., assignors to Allied Corporation, Morristown, N.J.

Division of Ser. No. 319,496, Nov. 9, 1981, Pat. No. 4,426,496. This application Aug. 29, 1983, Ser. No. 527,591

Int. Cl.[3] H01R 43/04

U.S. Cl. 29—753 5 Claims

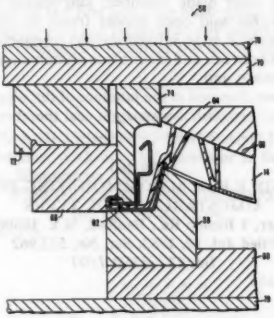


1. In combination with a crimping apparatus of the type adapted to crimp one of the ends of a plurality of wires in a metal sleeve holder, including a plurality of indentors; means supporting said indentors to be radially converged and evenly arranged about said holder, and means for forcing all of said indentors simultaneously into the sides of said holder to crimp the same against said wires, the improvement wherein each of said indentors has a Vee-shaped tip forming an edge extending generally parallel to the length of said holder and forming valley shaped crimp recesses in said holder upon advance thereunto, said means for supporting said indentors comprising a generally cylindrical nest having a series of radially converging slots formed on one end thereof, with each indentor being elongated and slidably disposed in a respective one of said slots; said means for forcing said indentors into the side of said holder comprising a cam sleeve having a bore slidably received over the exterior of said nest and having an internal sloping shoulder formed in said bore; and wherein each of said indentors is formed with a sloping cam surface on the radially outside end thereof located to be engaged by said internal shoulder of said cam sleeve upon axial advance of said cam sleeve over said nest, said cam sleeve formed with a pilot section having an internal passage formed therein and further including a prebundling tube slidably received within said internal passage and means for supporting said tube received over the free ends of said wires extending from said holder during said crimping.

4,509,256
MANUFACTURING APPARATUS FOR LAMINATE STRUCTURE

Lawrence C. Ladouceur, Windsor, Canada, assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1983, Ser. No. 469,887
Int. Cl.[3] B23P 10/00, 11/00
U.S. Cl. 29—802 1 Claim



1. An apparatus for manufacturing the laminate structure of a metal and plastic lightweight wheel cover comprising:

an upper and lower support means;

a wheel cover support means mounted on said lower support means, the upper surface of said wheel cover support means complementing the axially outwardly facing surface of the outer peripheral region of said wheel cover;

a flange die curling means mounted on said upper support means, said flange die curling means being positioned radially outward of and above said wheel cover support means;

a jagged edged barbs seating means mounted on said upper support means, said barbs seating means being radially inward of said flange die curling means and above said wheel cover support means; and

a means for applying pressure to said flange die curling means and said barb seating means, said wheel cover support means includes an annular riser, the upper surface of said riser complementing the outwardly facing surface of the outer peripheral region of said wheel cover, said flange die curling means and said jagged edged barbs seating means is combined into a single forming die, said jagged edged barbs seating means is an annular seating ring, said flange die curling means includes an annular curl ring.

4,509,257
METHOD OF AND APPARATUS FOR BARING THE END OF SHEATHED MULTICORE CABLE

Takashi Moriyama, 2-3-3, Uozaki-Nishimachi, Higashinada-ku, Kobe 658, Japan

Filed May 20, 1983, Ser. No. 496,425
Claims priority, application Japan, Jun. 18, 1982, 57-105634; Oct. 6, 1982, 57-176820
Int. Cl.[3] H01R 43/00; H02G 1/12
U.S. Cl. 29—825 13 Claims

1. A method of baring an end portion of an electric multicore cable including a plurality of coated wires enclosed in an outer sheath, said method comprising the steps of:

clamping said cable at first and second longitudinally spaced positions removed from said cable end;

making a circumferential cut in said sheath to form a cut sheath end portion adjacent said end;

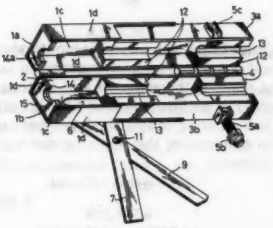
moving the clamped positions relative to each other to separate said cut end portion from the remainder of the sheath, and to expand said coatings beyond the ends of the wires;

trimming said expanded coatings substantially at said wire ends;

releasing the clamping and removing said cut sheath end portion to allow the expanded coatings to return to normal positions and thereby expose said wires.

2. A method of baring an end of an electric cable including a plurality of coated wires enclosed in a sheath, comprising the steps of tightly gripping an end portion of the cable, tightly gripping said cable at a location which is spaced from said end portion, cutting said sheath between said first and second clamp means, moving said second clamp means away from said first clamp means after said sheath has been cut, said second clamp means gripping said cable sufficiently to move said cable and said wires with it, and said first clamp means holding said cut end portion of said sheath and said coating against said movement, said coatings and said cut end portion of said sheath are extended past the ends of said wires, severing said sheath and said coatings at the ends of said wires, releasing said grips on said cable, and removing said cut end portion of said sheath to enable said extended coatings to retract from the ends of said wires.

3. Apparatus for baring an electric cable including a plurality of coated wires covered by a sheath, said apparatus comprising:



a pair of box-like frames, hinge means having a hinge axis, said frames being attached to said hinge means and thereby hinged together for movement between open and closed positions, said frames being adapted to receive the cable therebetween, the cable extending generally parallel with said hinge axis;

a first pair of adjacent clamp members, each of said members of said first pair being fastened to one of said frame adjacent one end thereof;

a second pair of adjacent clamp members, each of said members of said second pair being attached to one of said frames and slideably supported within said frames and slideable generally parallel with said hinge axis;

a pair of adjacent cutter blades, each of said blades being attached to one of said frames and said pair of blades being supported within said frames adjacent said pairs of clamp members, and each of said blades having an arcuate cutting edge for cutting through said sheath; and

lever means coupled to said frames and to said movable clamp members for moving said second pair of clamp members relative to said first pair of clamp members.

4,509,258
CONNECTOR CENTERING DEVICE AND METHOD FOR USING

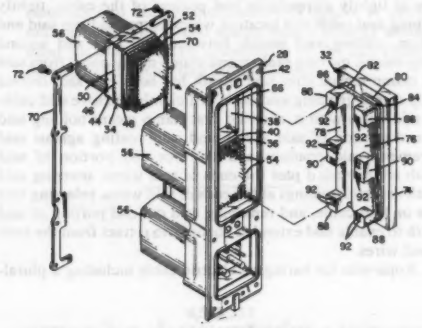
Ronald P. Locati, and James A. Rickrode, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 8, 1982, Ser. No. 396,223
Int. Cl.[3] H01R 43/00; B23P 19/00
U.S. Cl. 29—876 18 Claims

1. A method of centering one or more electrical connectors in respective openings of a shell member, each of said electrical connectors having rows of passageways for containing electrical terminals therein, comprising the steps of:

placing a centering device in engagement with walls of a said shell member and centering said shell member;

moving a said electrical connector into an opening in the shell member and into engagement with connector-engaging means of said centering device thereby centering the electrical connector in the opening; and



securing the electrical connector onto the shell member such that said connector remains centered in said opening following removal therefrom of said centering device.

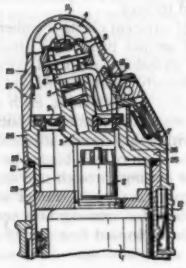
7. A method as set forth in claim 1 further comprising, after centering and securing in said shell member said one or more of electrical connectors, the step of removing said centering device therefrom.

4,509,259

ELECTRIC SHAVER

Hiromi Kakumoto; Shinji Ihara; Yoji Iguchi, and Makoto Miyata, all of Shiga, Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Continuation of Ser. No. 384,888, Jun. 4, 1982, Pat. No. 4,426,776. This application Dec. 9, 1983, Ser. No. 559,807
Claims priority, application Japan, Jun. 15, 1981, 56-92734
Int. Cl.³ B26B *19/10*
U.S. Cl. 30—34.1 **8 Claims**



1. An electric shaver having at its upper end an outer blade frame carrying an outer blade said shaver comprising:

a motor housing having therein a motor;

an inner blade frame having thereon a plurality of spaced inner blades positioned to be driven in slidable movement relative to said outer blade;

a drive element operatively connected to the motor to be driven thereby to move and having at its upper end portion a drive rod portion which is coupled to said inner blade frame;

a support interposed between the housing and the outer blade frame, said support being in the form of a sleeve having at its upper end an open border frame and which defines thereabove with the outer blade frame an inner blade chamber for receiving therein the inner blade frame and the drive rod portion of the drive element and which further defines adrive unit chamber in the housing for receiving the motor;

a sealing plate of resilient material having a central opening through which said drive rod portion extends upwardly into said inner blade chamber, said sealing plate being seated within said open border frame so that its outer circumferential edge is fixed thereto to establish a watertight seal between said inner blade chamber and said drive unit chamber; and

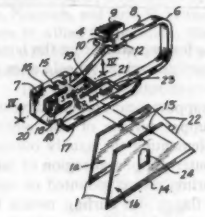
sealing means disposed at the juncture of the support and the housing to establish a watertight seal therebetween.

4,509,260

KNIFE HANDLE FOR ACCOMMODATING DIFFERENT ADJUSTABLE BLADE TYPES

Donald Gringer, 1 Bishop Rd., Bedford, N.Y. 10506

Filed Jul. 12, 1983, Ser. No. 512,962
Int. Cl.³ B26B *1/00*
U.S. Cl. 30—162 **9 Claims**



1. In an improved retractable knife comprising a housing defining a hollow interior chamber with a passage thereinto from the front of said housing, said chamber having a top and a bottom, a longitudinal slit extending from the top of said housing into said chamber at the top thereof, a blade carriage within said chamber, said carriage being made of a tough resilient plastic and comprising a simple beam of resilient material, a button disposed outside said housing at the top thereof, and means for connecting said button to a central portion of said beam, said carriage being slidable in said housing toward and away from said passage, said connecting means extending through said slit and being movable therealong when said carriage slides within said chamber, means for supporting said beam at both ends, said beam being deflectable between said supporting means in a given plane, a blade detachably secured to said carriage in a plane that is parallel to said given plane of deflection of said beam, and detent means associated with said carriage and said housing for releasably holding said carriage against said sliding movement, said detent means being released when said resilient simple beam is deflected; the improvement comprising a pallet formed at the frontal portion of said beam, said pallet comprising a plurality of spaced apart register pins disposed along an upper edge thereof, a blade carrying ledge disposed along an opposed lower edge thereof, a pair of longitudinally extending vertically spaced apart blade side support members disposed between said upper and lower edges, one of said blade side support members being disposed substantially along the longitudinal axis of said beam and comprising a pair of flexible laterally biasable cantilevered arms cantilevered from a support member, the forwardmost arm having a lug disposed at the distal end thereof and the rearwardmost arm having a first rear edge blade guide element disposed at the distal end thereof with respect to the support member from which said arms are cantileverd, said other blade side support member disposed adjacent said ledge and having a second rear edge blade guide element at the distal end

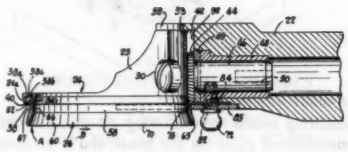
thereof, said blade side support members being capable of interchangeably securely supporting at least solid type blades and apertured type blades on said carrier, said cantilevered arms being laterally biased under lateral loading from a solid type blade while said solid type blade is engagingly retained between said second rear edge blade guide in cooperation with said register pins and said ledge, and further being capable of interchangeably engagingly retaining an apertured type blade between said lug and first rear edge blade guide in cooperation with said register pins and ledge; whereby different type blades may be interchangeably mounted for use in said retractable knife.

4,509,261

BONING AND TRIMMING KNIFE AND HOUSING

Louis A. Bettcher, Amherst, Ohio, assignor to Bettcher Industries, Inc., Birmingham, Ohio

Filed Dec. 14, 1981, Ser. No. 330,553
Int. Cl.³ A22C *17/04*
U.S. Cl. 30—276 **28 Claims**



1. A hand knife for cutting meat and the like comprising a handle; a ring-like blade housing at one end of the handle; a continuous ring blade rotatable in the housing; said housing having an arcuate recess that opens toward one axial end of the housing, spaced inwardly of the outer periphery of the housing, and having an arcuate wall surface engageable by and at least partially encircling the blade, the greatest radius of the wall surface being at said one axial end of the housing to allow assembly of the blade with the housing from the said one axial end; said blade having gear teeth at one axial end received in said recess, a cutting portion extending from the housing, and an exterior flange about the periphery of the blade; said recess being of a depth greater than the axial length of the blade from the exterior flange to the one axial end of the blade having gear teeth; and means including a blade retainer movably connected to the handle, engageable with the housing, and located to oppose the exterior flange, to retain the blade in the housing without applying clamping force to the blade.

4,509,262

MOUNTING ARRANGEMENT FOR LENGTH MEASURING DEVICE

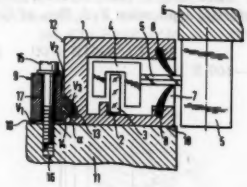
Guenther Nelle, Bergen, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Jan. 18, 1984, Ser. No. 572,166
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1983, 3302643
Int. Cl.³ G01B *11/04*
U.S. Cl. 33—125 R **9 Claims**

1. In a measuring apparatus for measuring the relative position of two objects, of the type comprising a measuring scale which extends along a longitudinal direction and a carrier which supports the measuring scale, the improvement comprising:

a lateral stop;

at least one clamping shoe for mechanically clamping the carrier to the mounting surface, said clamping shoe comprising a first contacting surface which contacts a second contacting surface defined by the carrier, at least one of the first and second contacting surfaces being inclined with respect to the mounting surface such that the clamping shoe develops a contact force K having two force components K_1, K_2 perpendicular to one another in a plane perpendicular to the longitudinal direction, the



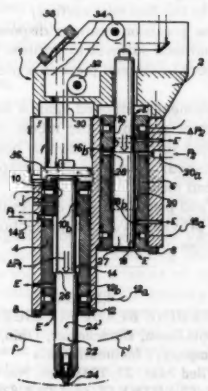
force component K_1 operating to hold the carrier against the mounting surface, the force component K_2 operating to hold the carrier against the lateral stop.

4,509,263

LASER SENSING MEANS FOR DIMENSIONAL CONTROL PURPOSES

Philippe Andrié, Longpont s/Orge, and Jacques Mimeur, Veyrier du Lac, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jul. 20, 1983, Ser. No. 515,580
Claims priority, application France, Jul. 29, 1982, 82 13241
Int. Cl.³ G01B *7/28*
U.S. Cl. 33—169 R **8 Claims**

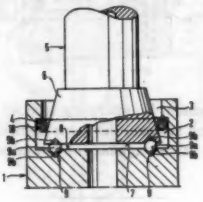


1. A sensing device having a body, first and second parallel bores in said body, a sensor slidably fitted in said first bore, and guided therein by pneumatic bearings, a counter weight having the same weight as the sensor, slidably fitted in said second bore and guided therein by pneumatic bearings, first and second pulleys pivotedly fitted on said body, a wire passing over said first and second pulleys, and connecting the sensor to the counterweight, means for exerting a pressure on the sensor, means for measuring the sensor displacement, wherein said body has an annular chamber surrounding the sensor, said annular chamber being connected to a pressure source, a shoulder in the sensor, a second annular chamber in said body, said second annular chamber surrounding said counterweight, and being connected to a second pressure source, a shoulder in said counterweight, the surface of the sensor shoulder being larger than the surface of the counterweight shoulder.

4,509,264
SENSING HEAD WITH OVERLOAD PROTECTION

Kurt Feichtinger, Pailing, Fed. Rep. of Germany, assignor to Dr. Johannes Heidenhain GmbH, Traunreut, Fed. Rep. of Germany

Filed Aug. 1, 1983, Ser. No. 518,930
Claims priority, application Fed. Rep. of Germany, Aug. 12, 1982, 3229991
Int. Cl.³ G01B *3/00*
U.S. Cl. 33—169 R **5 Claims**



1. In a sensing head for a measuring or processing machine, wherein the sensing head comprises a sensing head casing and a mandrel adapted for mounting to the measuring or processing machine, the improvement comprising:

means for defining a recess in the casing, which recess defines an undercut region adjacent an opening in the casing and a first base surface;

an end piece secured to the mandrel and having a truncated conical shape which comprises a second base surface and a conical surface, said end piece sized to pass into the recess through the opening with the second base surface opposed to the first base surface;

at least three precision bearings disposed between the first and second base surfaces to position the casing precisely with respect to the end piece in a predetermined orientation; and

a resilient element positioned against the conical surface in the undercut region of the recess to bias the first and second base surfaces together to hold the casing in the predetermined orientation with respect to the mandrel and the end piece;

said recess, end piece, bearings and resilient element cooperating to provide overload protection against excessive tilting forces on the casing.

4,509,265
TURBINE BLADE MEASUREMENT

Charles W. Donaldson, Blanchester, Ohio, assignor to General Electric Company, Cincinnati, Ohio

Filed Mar. 21, 1983, Ser. No. 477,272
Int. Cl.³ B23Q *17/16*; G01B *3/00, 11/00*
U.S. Cl. 33—174 PA **4 Claims**

1. Apparatus for supporting a gas turbine engine blade which has a root having an upstream portion and a dovetail portion; a platform having a radially inner side; and an airfoil having a tip, a leading edge, and a low pressure side, comprising:

(a) a bracket;

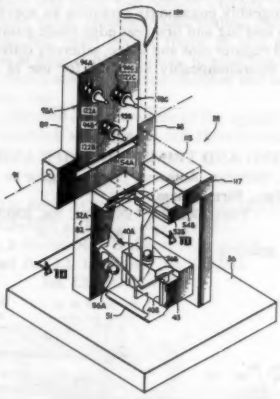
(b) a spherical first support positioned at a first predetermined position with respect to the bracket for supporting the upstream portion of the root;

(c) a spherical second support positioned at a second predetermined position with respect to the bracket for supporting the platform;

(d) cylindrical third and fourth supports positioned at respective third and fourth predetermined positions with respect to the bracket for supporting the dovetail portion;

(e) a cylindrical fifth support positioned at a fifth predetermined position with respect to the bracket for supporting the low pressure side;

(f) a cylindrical sixth support positioned at a sixth predetermined position with respect to the bracket for supporting the leading edge; and

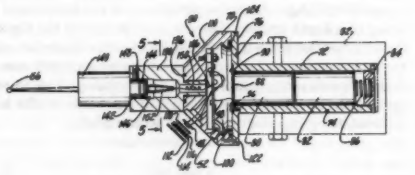


(g) measuring means for measuring the distance between a predetermined point on the blade and a predetermined reference.

4,509,266
TOUCH PROBE

Robert F. Cusack, Grosse Pointe, Mich., assignor to GTE Valeron Corporation, Troy, Mich.

Continuation-in-part of Ser. No. 388,187, Jun. 14, 1982, Pat. No. 4,451,987. This application Jun. 14, 1983, Ser. No. 504,066
Int. Cl.³ G01B *7/02*
U.S. Cl. 33—174 L **18 Claims**



7. Apparatus for detecting contact with another object, said apparatus comprising:

a housing having stylus means projecting from one end thereof for contacting an object, said housing having a generally conically shaped middle portion having an outer surface converging toward said stylus, said middle portion having a given cross sectional dimension and including a surface extending generally perpendicular to the axis of the stylus;

an elongated, hollow, generally cylindrical portion of reduced cross sectional dimension with respect to the middle portion and extending from an opposite end of the housing, said cylindrical portion being adapted to be mounted in a machine in the same manner as a tool;

circuit means within the housing for generating signals associated with stylus contact with the object;

battery means in said cylindrical portion for powering said circuit means; and

optical transmission means on said converging outer surface of the housing middle portion, adapted to provide an

optical signal to a remote receiver associated with stylus contact with the object.

11. In a probe for detecting contact with a workpiece, said probe having a movable stylus at one end thereof and mounting means on an opposite end thereof for mounting the probe in a machine adapted to move the probe relative to the workpiece, with the probe further including circuit means therein for generating a signal when the stylus moves upon contact with the workpiece, the improvement wherein the mounting means comprises:

an elongated member having exterior portions thereof conforming to a receptacle in the machine for mounting the probe thereto, the interior of said member including a coaxially extending hollow bore therein adapted to slidably receive a plurality of cylindrical batteries for providing power to the circuit means; and

removable cap means on the end of said member adapted to permit said batteries to be inserted and removed from the interior of said member whereby said member serves the dual purpose of providing the mounting means for the probe and to house the batteries.

4,509,267

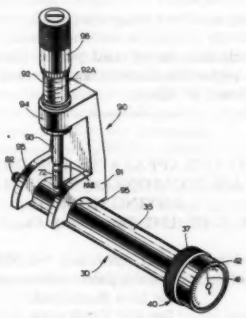
PRESET INDICATOR ASSEMBLY

James F. Flaten, Burnsville, Minn., assignor to Tobin-Arp Manufacturing Company, Eden Prairie, Minn.

Filed Mar. 7, 1983, Ser. No. 472,613

Int. Cl.³ G01B 5/12

U.S. Cl. 33—185 R **3 Claims**



1. A method of aligning the axes of bores through housings of a part to be bored along a common axis, and using a boring bar supported in at least one hanger having means for rotatably supporting such boring bar and comprising the steps of:

measuring the interior of the bore to be worked upon;

providing an indicator assembly mounted on a substantially cylindrical sleeve having a radially extending post operably coupled to the indicator dial to indicate the amount of extension of the post;

setting the post extension to the desired radius from the center of said cylindrical sleeve;

placing the cylindrical sleeve in the boring bar hanger and with the post inside a bore;

moving the part to be machined in a direction transverse to the sleeve to engage the post and to return the indicator to substantially a zero reading;

rotating the cylindrical sleeve 90° and moving the part to be machined with the post in the same bore until the indicator reaches the desired reading;

fastening the part securely in the machine when centered after the above steps, and inserting a boring bar in the hanger in place of the cylindrical sleeve.

4,509,268

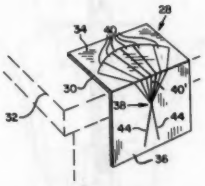
DENTAL CURET SHARPENING GUIDE

Barbara J. Marquam, 7321 SW. Corbett, Portland, Oreg. 97219, and Dana J. Lillie, 2375 S. Dogwood Ter., Cornelius, Oreg. 97113

Continuation of Ser. No. 295,693, Aug. 24, 1981, abandoned. This application Aug. 15, 1984, Ser. No. 641,363

Int. Cl.³ B24B 3/36

U.S. Cl. 33—201 **4 Claims**



1. A sharpening guide for curved dental curet blades having a top flat surface and at least one angled side surface that joins with the top surface in a top cutting edge, said guide comprising

(a) a base member arranged to be configured for fitting over a right angle edge of a table top,

(b) said base member having opposite side surfaces with one side surface being arranged to face and engage the right angle edge of a table top and the other side surface having first and second substantially planar surface portions arranged to be disposed at a right angle to each other;

(c) said first surface portion being arranged substantially horizontally upon fitting said base member over the edge of a table and said second surface portion being arranged substantially vertically;

(d) positioning means on said second surface portion of the base member for denoting a location for positioning the blade of a curet;

(e) sighting means on said first surface portion of the base member for aligning a selected part of the curet other than the blade such that the blade repeatedly assumes the same position and orientation for engagement by a manually held reciprocatable grinding stone on one side surface of the blade to sharpen its cutting edge, said sighting means comprising a plurality of sections at angularly divergent locations configured for alignment of variously shaped curets, said sighting means extending onto said second surface portion and forming a vertex of angularly divergent lines providing an upwardly opening V-shape, said sections being bent in their divergent angles at the corner of said first surface portion and said second surface portion to compensate for parallax introduced by viewing the sharpening guide from an angle; and

(e) stone guide means on said second surface portion of the base member below the positioning means for aligning a sharpening stone adjacent the blade of the curet at said positioning means and at an angle to the face of the blade for grinding the side surface.

4,509,269

TARGET FOR MEASUREMENTS WITH ANGLE-MEASURING INSTRUMENTS

Helmut Leitz, Konigsbronn, Fed. Rep. of Germany, assignor to Carl-Zeiss-Stiftung, Oberkochen, Fed. Rep. of Germany

Filed Mar. 31, 1983, Ser. No. 480,815

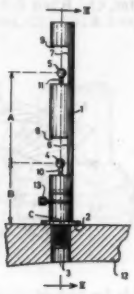
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3214998

Int. Cl.³ G01C 15/06

U.S. Cl. 33—293 **14 Claims**

1. A target device for marking a measuring point (C) on the surface of an object which is difficult to sight with an angle-

measuring instrument, said device comprising an elongate rigid rod having a base end, a radial flange at the base end and means beneath the flange for securing the rod to the object with the flange abutting the surface of the object and with the axis of the rod centered at the point to be measured, a first measurement



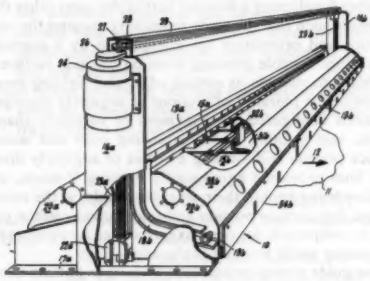
mark fixed to said rod at a first predetermined offset from the intersection of the rod axis with the radial plane of the underside of said flange, and a second measurement mark fixed to said rod at a second predetermined offset from the underside of said flange, the centers of said marks being in fixed alignment with said intersection of the rod axis with said radial plane.

4,509,270

METHOD AND APPARATUS FOR DRYING A MOVING WEB

Erik Stephansen, Hillsborough, Calif., assignor to Impact Systems, Inc., San Jose, Calif.

Filed May 26, 1983, Ser. No. 498,298
Int. Cl.³ F26B *3/28*
U.S. Cl. 34—4 **11 Claims**



1. A method of drying a moving web comprising the following steps:

providing across the transverse cross-direction of said web a pair of elongated dryer units each extending from one edge of said web to the other, each having radiation emitting surfaces facing said web and being in close proximity to said web to dry it;

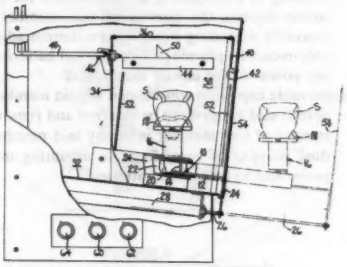
moving said pair of dryer units to a stowed position in which the radiation emitting surfaces of said units which were formerly facing said web are now closely juxtaposed and co-extensive with each other and have the same boundary with each other to form a closed envelope for retaining heat produced by said radiation emitting surfaces whereby the escape of infrared radiation from said drying elements to the surrounding area and direct radiation to other surfaces is prevented to minimize fire hazards.

4,509,271

TREATMENT OF ARTICLES HAVING A COATING OF A MOISTURE-CURABLE COMPOSITION

Nigel R. Tout, Leicester, and Raymond Hanson, Rearsby, both of England, assignors to USM Corporation, Farmington, Conn.

Filed Nov. 4, 1982, Ser. No. 439,279
Claims priority, application United Kingdom, Nov. 14, 1981, 8134392; Oct. 21, 1982, 8230200
Int. Cl.³ F26B *3/04*
U.S. Cl. 34—12 **8 Claims**



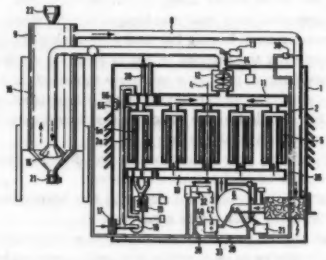
1. Method of treating an article, e.g. a shoe part, having a coating of a moisture-curable composition, characterised in that the article is supported stationarily in an enclosed chamber for a period of between 5 and 25 seconds, during which period the article is subjected to infra-red radiation from a radiant source having a surface temperature of between 420° and 250° C. and a quantity of steam at ambient pressure is supplied to the chamber such that during said period the humidity of the atmosphere within the chamber is maintained at a dew point of between 50° and 60° C.

4,509,272

METHOD AND APPARATUS FOR DRYING MOIST EXHAUST AIR FROM ONE OR MORE BULK MATERIAL DRYING HOPPERS

Roderich W. Gräff, 1311 Pine Valley Ct., Ann Arbor, Mich. 48104

Filed Mar. 17, 1982, Ser. No. 359,114
The portion of the term of this patent subsequent to Nov. 8, 2000, has been disclaimed.
Int. Cl.³ F26B *3/14*
U.S. Cl. 34—27 **5 Claims**



1. In a method of drying exhaust air from one or more bulk material drying hoppers, comprising the steps of conveying exhaust air from a bulk material drying hopper through at least one chamber filled with an adsorbing medium and feeding the air back to the drying hopper in a closed circuit, the chamber being regenerated at intervals by a counterflow of drying gas,

the improvement comprising the step of controlling the frequency of regeneration the chamber as a function of the temperature of the exhaust air from the drying hopper.

4,509,273

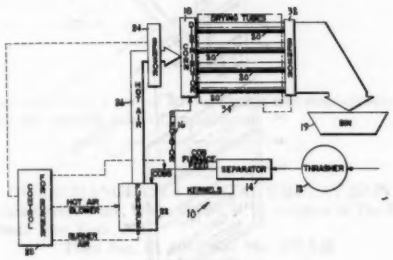
COMBINE GRAIN DRYER AND DRYING ATTACHMENT

David Roisen, Rte. 2, Dawson, Minn. 56232

Continuation of Ser. No. 233,924, Feb. 12, 1981, abandoned. This application Apr. 2, 1982, Ser. No. 365,002

Int. Cl.³ F26B *17/20*

U.S. Cl. 34—86 **11 Claims**



1. In combination with a grain crop harvesting combine wherein the combine includes means for separating the grain of the plant from residue material such as plant husks, leaves, cobs, and stalks; a grain drying attachment, comprising:

(a) a grain distributor in which the separated grain is received;

(b) a dried grain storage bin;

(c) means for transferring the grain from said distributor to said bin;

(d) a burner chamber in which the residue material is deposited and burned to generate thermal energy, said burner chamber comprises a furnace capable of burning both the residue material and combustible gaseous products of the burning material, said furnace comprising:

(i) a firebox defined by a generally cylindrical wall having an upwardly placed aperture;

(ii) a hopper having a downwardly and inwardly sloping wall, said hopper being seated in said aperture;

(iii) air inlet means disposed proximate the bottom of said firebox;

(iv) a perforated combustion product exhaust conduit positioned centrally within said firebox; said conduit having a peripheral wall;

(v) an inverted generally V-shaped baffle overlying said conduit and having a pair of legs, each with an extremity extending laterally beyond said peripheral wall of said conduit; and

(vi) a pair of baffles extending downwardly and inwardly from said generally cylindrical wall of said firebox and positioned above, and spaced from, said generally V-shaped baffle, each pair of baffles overlapping one of said legs of said generally V-shaped baffle; and

(e) means for using said thermal energy to dry the grain as it is transferred from said distributor to said bin.

4,509,274

EQUIPMENT FOR DRYING LENGTHS OF MATERIALS

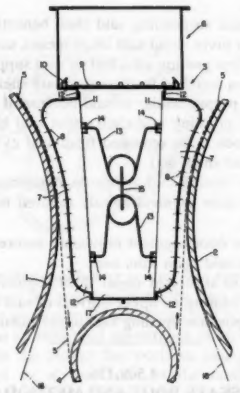
Helmut Heimel; Willy Schlosser, and Alfred Luttenberger, all of Graz, Austria, assignors to Maschinenfabrik Andritz Actiengesellschaft, Graz, Austria

Filed Dec. 21, 1982, Ser. No. 451,954

Int. Cl.³ F26B *13/08*

U.S. Cl. 34—114 **3 Claims**

1. In equipment for drying lengths of material, in particular webs of paper, with the web being guided by means of a continuous permeable belt around an arc of a drying drum and being deflected by a guide roller toward a next drying drum which is enveloped in the same manner, blow boxes comprising blowout sections having apertures for directing a drying medium against the web, said blowout sections being arranged between said drums, in spaced relation to said guide roller and within the loop formed by said continuous permeable belt, said blow boxes having walls adjacent the surfaces of adjacent



drying drums, the improvement comprising means mounting said blowout sections having apertures in a displaceable manner in the radial direction of the drying drums within a frame so as to allow for movement of the apertured blowout sections away from the drying drums when an irregularity in the material, such as a nodule, passes between the drying drums and apertured blowout sections, and means whereby said sections can be returned into their initial positions.

4,509,275

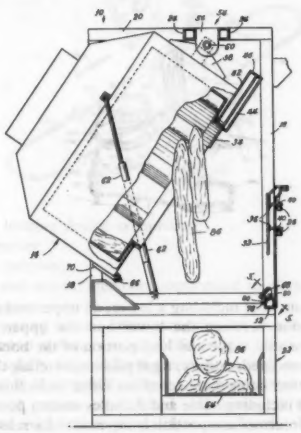
DRYER HAVING TOP PIVOT FOR TUMBLER

Randall R. Coffman, McHenry, and James E. Mitchell, Algonquin, both of Ill., assignors to Norman Dryer Company, Inc., Crystal Lake, Ill.

Filed Oct. 17, 1983, Ser. No. 542,524

Int. Cl.³ F26B *11/02*

U.S. Cl. 34—126 **15 Claims**



1. In a dryer for extracting moisture from wet goods, includ-

ing a tumbler cylinder mounted for rotation about a horizontal axis, an open side of said cylinder through which wet goods are inserted and dry goods are removed, a shell in which the cylinder is housed, means for supplying heated air to the cylinder for drying goods therein, and means for rotating the cylinder within the shell about said horizontal axis, the improvement comprising

a. a fixed external support having a portion extending above said shell,

b. hinge means suspending said shell beneath said support portion for pivot about said hinge means, said hinge means having a first portion attached to said support and a second portion attached to the top of said shell and having a pivot axis perpendicular to said horizontal axis,

c. means for pivoting said shell about said hinge means to permit goods to be removed from said cylinder directly beneath said shell, and

d. a door for closing said open side, comprising

i. a lower door segment fixedly secured to said external support,

ii. an upper door segment moveably secured to said shell adjacent said open side, and

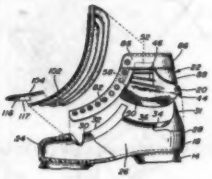
iii. means to shift said upper door segment from a first position closing an upper portion of said open side to a second position opening said upper portion.

4,509,276

COMPOSITE SKATE BOOT AND METHOD OF MAKING THE SAME

Rene Bourque, Duvernay, Canada, assignor to Warrington Inc., Montreal, Canada

Filed Jan. 28, 1983, Ser. No. 462,118
Int. Cl.³ A43B 5/16
U.S. Cl. 36—115 **12 Claims**



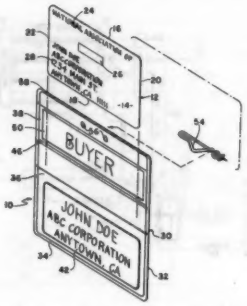
1. A skate boot including a lower, an upper and an intermediate portion between the lower and the upper; the lower including a sole, a toe and heel portion of the boot and being made of a molded, unitary, rigid plastics material; the intermediate portion being connected on either side thereof to the lower and including ankle and Achilles tendon portions of the boot, the intermediate portion being made of a relatively flexible material; the upper including a collar and an upper tendon guard, the upper being connected to upper edge portions of the intermediate portion, the upper being made of a pliable material.

4,509,277

COMBINATION BADGE AND CARD HOLDER

Edgar A. Bolton, Thousand Oaks, Calif., assignor to Registration Control Systems, Ventura, Calif.

Filed Feb. 2, 1983, Ser. No. 463,124
Int. Cl.³ A44C 3/00
U.S. Cl. 40—1.5 **3 Claims**



1. A badge for an individual attending a convention, comprising:

a holder formed from a first plastic sheet, the holder having a compartment formed by a second plastic sheet superimposed and connected to the first sheet;

a first card removably and partially received in the compartment, said first card bearing machine-readable information regarding a mailing address of the individual on a bottom portion and visually-discernible information regarding the convention along an exposed upper portion thereof which extends above the second plastic sheet;

a second card bearing the name of the individual, the second card being adhesively attached to the second plastic sheet and overlying the portion of the first card bearing the machine-readable information;

a pocket formed from a third plastic sheet superimposed and connected to the first sheet, and an insert bearing visually-readable information regarding the individual's function at the convention inserted therein; and

means for retaining the badge on an article of apparel wherein the compartment and the pocket are each visible while so retained on the article of apparel.

4,509,278

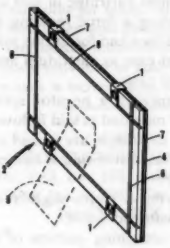
CLIP FOR PORTRAIT FRAMES AND THE LIKE

Pietro Astolfi, Bologna, Italy, assignor to Pico-Glass S.p.A., Italy

Filed May 16, 1983, Ser. No. 494,654
Claims priority, application Italy, Feb. 11, 1983, 4746/83[U]
Int. Cl.³ A47G 1/06; G09F 1/12
U.S. Cl. 40—156 **4 Claims**

1. A clip for portrait frames and the like, of the type constituted by a metal strip that deforms elastically and is so shaped as to wrap around one edge of a frame and to place a first terminal part in contact with the front surface of said frame, and to place a second terminal part, at the opposite end to the first terminal part, in the region of a slot made in the outer surface of the back part of said frame, wherein said strip, in the non-operative position, is defined, in between said terminal parts, by two substantially flat sections which form, one with the other, an angle of less than 90°, said sections constituting a covering section, to be placed adjacent to one of said edges on said frame, and a rear section, to be placed adjacent to the back

part of said frame, the latter section being provided at one extremity with an integral pressure tongue placed oblique



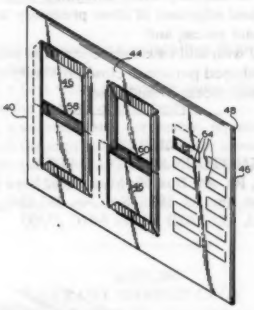
thereto and with a pair of strengthening ribs respectively disposed on opposite sides of said tongue.

4,509,279

INTERCHANGEABLE DIGITAL DISPLAY SIGN

William Greenberger, White Plains, N.Y., assignor to The Hopp Press, New York, N.Y.

Filed Jan. 13, 1983, Ser. No. 457,526
Int. Cl.³ G09F *3/04*
U.S. Cl. 40—447 **5 Claims**



1. A sheet, constructed of a single resilient plastic piece, having a face with at leat one opening therein and having a plurality of flaps with color contrasting portions thereon, the flaps being disposed about the periphery of said openings; and

a first rear panel having color contrasting portions thereon and extending from a bottom portion of the face and being pivotable thereabout, the first rear panel being adapted to fold against a back of the face, forming a pocket between the face and the first rear panel, wherein the color contrasting portions of the flaps and the rear panel are adapted to cooperate with each other to display one of a number of possible characters, the color contrasting portions of the first rear panel being visible through the opening in the face.

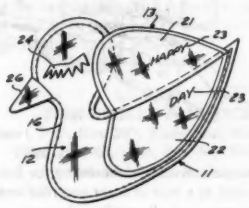
4,509,280

THREE-DIMENSIONAL GREETING CARD

Veronica Smith, 7 Smedley Dr., Newtown Square, Pa. 19073

Filed May 19, 1983, Ser. No. 437,866
Int. Cl.³ G09F *7/00*
U.S. Cl. 40—486 **1 Claim**

1. An information carrying toy device comprising a body member shaped to simulate at least a portion of an animated creature including a double layered first section in the form of an envelope having two panels of a soft flexible fabric web, the two panels being secured together around their periphery, which is shaped to define the animated creature, and containing a soft compressible filler of such form and size to resiliently space the panels apart a maximum distance small compared to the longitudinal dimension of the first section in order to provide a dimension of thickness to the first section, a second flap section of soft flexible fabric web joined to said first section at least along a seam providing a hinge, said first and second sections having surfaces which are in overlying confronting relationships in a closed position, representation of features



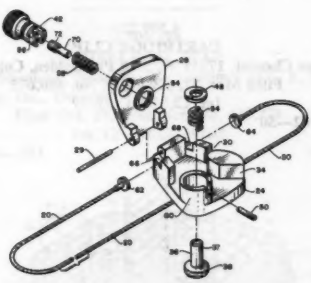
simulating animation, including at least one eye, being applied to visible parts of the sections when the flap is closed on the side of the first section to which the second is attached, such that the toy has an enhanced appearance of an animated creature, at least in the closed flap position, and an information display carried on at least one of the confronting faces, whereby using the seam as a hinge the second section may be moved relative to the first section about the hinge to an open position so as to expose the information display to view.

4,509,281

GUN TRIGGER LOCK

Ronald Dreiling, 24528 Kansas St., Newhall, Calif. 91321, and Blaine Perrella, 17357 Chase St., Northridge, Calif. 91325

Filed Aug. 19, 1982, Ser. No. 409,450
Int. Cl.³ F41C *27/10*
U.S. Cl. 42—1 Y **27 Claims**



1. A gun locking device comprising;

a first member;

a second member;

said first and second members constructed to mate around a gun trigger;

interconnecting means interconnecting to secure said first and second members around said trigger comprising;

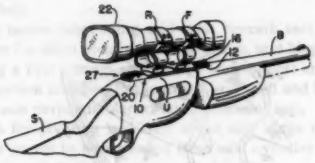
a pair of axially aligned latch members having means latching said pair of axially aligned latch members together; said latch means constructed and arranged to require opposite axial and rotational forces to be simultaneously applied to said pair of latch members for unlatching and removing said first and second members.

4,509,282

SIGHT AND SCOPE CONVERSION MOUNTING

Carlos H. McMillon, Vandalia, Ohio, assignor to Mack's Guns, Vandalia, Ohio

Filed Jun. 20, 1983, Ser. No. 505,907
Int. Cl.³ F41G 1/38
U.S. Cl. 42—1 ST 10 Claims



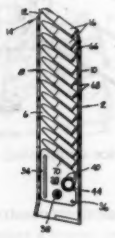
1. A sight and scope conversion mounting for front and rear sight members as well as a pair of front and rear scope support loop pieces on fire arms including rifles, shotguns, pumps, and automatic weapons having at least one barrel and stock longitudinally spaced from each other as joined to an intermediate firing mechanism having an upper surface therebetween, said sight and scope conversion mounting comprising: a unitary metal base substantially rectangular shaped in planar configuration though having a curved upper surface in intermediate location provided with mounting screw holes therein, a flattened, reduced-size end integral with said base and recessed to receive in combination therewith a front sight member including a longitudinal rib and aiming projection, an elevated and enlarged end integrally joined to said base at a location axially and longitudinally remote from said reduced size end, said enlarged end having T-shaped recessing complementary to receive also in combination therewith a rear sight member with a transverse groove carrying a downwardly notched transverse plate secured in the transverse groove, and a continuous rail-like rib projecting downwardly and extending accurately longitudinally aligned along an underside of said base from end to end thereof for complementary fixation on the upper surface of the intermediate firing mechanism.

4,509,283

CARTRIDGE CLIP

M. Gaines Chesnut, 17219 W. 57th Pl., Golden, Colo. 80401

Filed Mar. 31, 1983, Ser. No. 480,675
Int. Cl.³ F41C 25/02
U.S. Cl. 42—50 12 Claims



1. A cartridge clip comprising:

a case for storing cartridges having a pair of opposed longitudinally extending side walls and a pair of opposed longitudinally extending end walls;

each of said end walls having smooth continuous inner surfaces;

said side walls having a width greater than said end walls;

an opening adjacent the top of said case through which cartridges may be moved;

a follower mounted for movement in said case and adapted to contact the lowermost cartridge in said case;

spring means for providing a force resisting movement of said follower into said case and for urging said follower in a direction out of said case as cartridges are loaded into and moved out of said case;

said spring means comprising a negator spring with the major portion thereof mounted in said follower in a coiled relationship when no cartridges are in said case;

means for securing said negator spring at one end thereof to one of said end walls;

said negator spring having a width slightly less than the width of said one of said end walls;

substantially all of the remaining portion of said negator spring being mounted in means in said follower when no cartridges are in said case;

said means for securing said negator spring comprising means defining a recess having an outer surface in the outer surface of one of said end walls adjacent said opening adjacent the top of said case;

means for defining an edge on said recess adjacent said opening adjacent the top of said case;

said edge having a thickness less than the thickness of said one end wall;

a substantially inverted U-shaped portion adjacent said one end of said negator spring;

said inverted U-shaped portion extending from inside said case, over said edge and in close proximity to said outer surface of said recess; and

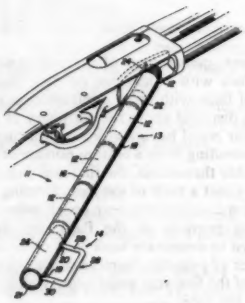
means integral with said case for securing the portion of said inverted U-shaped portion in close proximity to said outer surface of said recess to said case.

4,509,284

SHOTGUN SPEED LOADER

James R. Naber, Rt. #4, Box 60, Muscatine, Iowa 52761

Filed Apr. 22, 1983, Ser. No. 487,534
Int. Cl.³ F42B 39/06; F41C 27/00
U.S. Cl. 42—87 5 Claims



1. A shotgun speed loader comprising:

flexible wall means defining a column space for receiving at least one shell, and defining a storage position connected with said column space;

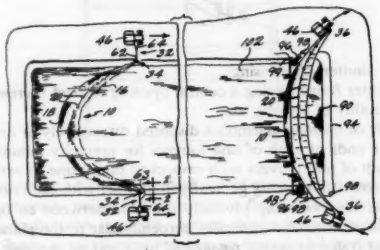
plunger means connected to said flexible wall means, positionable at said storage position whereby said flexible wall means fits around and holds said plunger means and the shell, and movable from said storage position to spread apart said flexible wall means and to push the shell, thereby effecting rapid discharge of the shell from said column space;

slot means is formed in said flexible wall means, and an

enlarged area is formed in said slot means and defines said storage position; and

said plunger means includes a plunger body and a handle joined to said plunger body, said handle engaged by said enlarged area when said plunger means is at said storage position, said handle movable in said slot means, and said plunger body movable in said column space, when said plunger means is moved from said storage position.

4,509,285
AQUACULTURE HARVESTER
C. Bruce Smith, P.O. Box 168, Kahuku, Hi. 96731
Filed Jun. 2, 1982, Ser. No. 384,280
Int. Cl.³ A01K *73/00*
U.S. Cl. 43—9 **28 Claims**



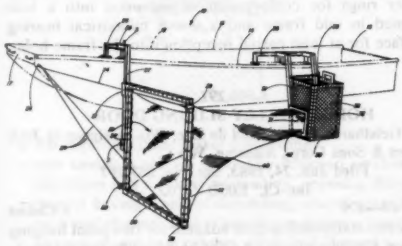
1. A method of harvesting aquaculture from a body of water comprising the steps of:

disposing a first water permeable, aquaculture impermeable web on the bottom of said body;

dragging a second water permeable, aquaculture impermeable web through said body of water toward said first web until any portion of said second web in said body of water is over said first web; and

lifting said first web to concentrate said aquaculture thereupon.

4,509,286
TRAWL SHRIMP CAGE
Martin John, 205 Brunswick Ct., New Orleans, La. 70114
Continuation of Ser. No. 322,023, Nov. 16, 1981, abandoned.
This application Sep. 29, 1983, Ser. No. 537,172
Int. Cl.³ A01K *71/00, 73/12*
U.S. Cl. 43—9 **7 Claims**



1. A vessel supported shrimp trawl cage, comprising:

a. at least one net supported at the water surface by the vessel so that a forward end of the net defines a net opening which can entrap shrimp swimming near the water surface and the rear of the net defines a tail;

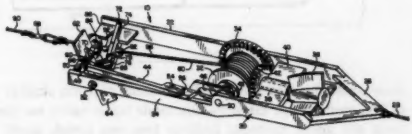
b. cage means supported in a partially submerged position by the vessel and having a cage inlet fed by the tail of the net so that shrimp caught in the net will eventually enter the cage and a cage outlet for discharging contents of the cage during trawling; and

c. gate means attachable to the cage means at the cage outlet for closing the cage outlet to retain the contents of the cage means during trawling;

d. frame means affixed to the vessel and extending laterally for supporting the net and the cage means in a lateral position with respect to and generally parallel to the vessel; and

e. the frame means comprises in part adjustable means for moving the cage means with respect to the net opening so that the net can be tightened or slackened by movement of the cage relative to the net.

4,509,287
FISH TROLLING DEVICE
Edwin I. Hood, P.O. Box 207, Eastsound, Wash. 98245
Filed Jun. 13, 1983, Ser. No. 503,908
Int. Cl.³ A01K *91/00*
U.S. Cl. 43—19.2 **7 Claims**



1. A trolling device for a fishing lure comprising:

a frame adapted to be towed through a body of water,

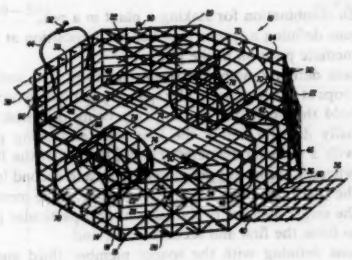
a spool rotatably mounted on said frame and a length of line connected at one end to said spool and adapted to be wound thereon,

said line trailing from said frame as said frame is towed, and being adapted for connection to a lure,

and drive means means on said frame for alternately driving said spool to cause said line to wind upon said spool and thereafter to reverse its rotation to unwind said line,

whereby said lure will alternately be accelerated toward said frame and next be caused to drop back from said frame as said frame is towed through the water.

4,509,288
SHELLFISH TRAP
C. Barrett Shepherd, Houston, Tex., assignor to C. E. Shepherd Company, Inc., Houston, Tex.
Filed Oct. 19, 1982, Ser. No. 435,228
Int. Cl.³ A01K *69/08*
U.S. Cl. 43—102 **8 Claims**



1. A shellfish trap comprising:

a circumferential body portion formed of mesh material and having an open top and an open bottom;

a top member connected to said body portion, said top member having a planar portion covering said open top of

said body portion and depending portions overlapping said body;

a bottom member connected to said body portion, said bottom member having a planar portion covering the open bottom of said body portion and upwardly extending portions overlapping, respectively, said depending portions and attached to said depending portions to directly connect said top member to said bottom member;

a first opening formed in said trap;

a first closure member;

means for connecting said first closure member over said first opening to prevent either unaided entry or exit of a shellfish through said first opening;

a second opening formed in said trap;

an elongated passage formed of mesh material connected to be aligned with said second opening and to extend inwardly of said trap; and

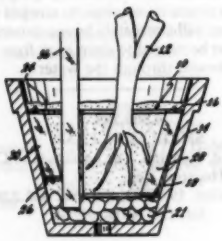
trapdoor means connected to the inner end of said passage to permit a shellfish to enter said trap but to inhibit the shellfish from exiting.

4,509,289

APPARATUS FOR STABILIZING PLANT SUPPORT STAKES IN POTS

Seymour Fogelson, 19841 Redwing St., Woodland Hills, Calif. 91364, assignor to Seymour Fogelson, Woodland Hills, Calif.

Filed Nov. 19, 1979, Ser. No. 95,635
Int. Cl.³ A01G 9/12
U.S. Cl. 47—70 **14 Claims**



1. In combination for staking a plant in a pot,

means defining a spacer member for disposition at an intermediate position in the pot,

means defining with the spacer member first and second loops at a pair of vertically spaced positions to receive and hold the plant, the second loop being disposed substantially directly below the first loop and being provided with a reduced diameter relative to that of the first loop wherein, the means defining the first and second loops and the spacer member are formed from a single member and the single member is pivotable at first particular positions to form the first and second loops, and

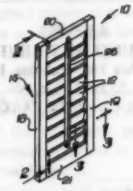
means defining with the spacer member third and fourth loops at a pair of positions directly below each other and respectively disposed in horizontally disposed relationship to the first and second loops to receive and hold the stake wherein, the third and fourth loops are disposed on the opposite side of the spacer member from the first and second loops.

4,509,290

SHUTTER CONSTRUCTION

Alvin M. Stanfield, Jr., 73591 El Hasson Cir., Palm Desert, Calif. 91206

Filed Mar. 18, 1983, Ser. No. 476,493
Int. Cl.³ E06B 7/08
U.S. Cl. 49—92 **23 Claims**



1. A shutter, comprising:

a shutter frame having a central opening formed therein;

a plurality of louvers; and

a pair of bushing assemblies disposed respectively at opposite ends of each of said louvers for pivotally mounting each of said louvers with respect to said frame to extend across said opening generally in parallel with each other, said louvers being pivotally movable between an open position oriented generally perpendicular to the plane of said frame to permit passage of light and air through the frame opening, and a closed position oriented generally within the plane of said frame and at least slightly overlapping one another to block passage of light and air through the frame opening;

said louvers including generally complementary-shaped ribs and grooves for interlocking engagement with each other in said closed position;

each of said bushing assemblies comprising

a support pin having an elongated shank including a series of first fetter rings for compression fit reception into a hole formed in the associated end of said louver and a cylindrical bearing surface having a length for at least partial reception into the louver hole and to project therefrom, said pin further having a flared head at the end of said pin opposite said first fetter rings, and a cylindrical bushing sleeve slidably receivable over and rotatable about said support pin, said sleeve having a smooth-surface inner diameter and an axial length less than the axial length of said support pin bearing surface, said sleeve further having an outer diameter surface defined by a series of second fetter rings for compression fit reception into a hole formed in said frame and a sleeve cylindrical bearing surface for at least partial reception into the frame hole.

4,509,291

HORIZONTALLY SLIDING DOOR

Alan C. Geisthardt, North Fond du Lac, Wis.; assignor to Jack Walters & Sons Corp., Allenton, Wis.

Filed Jun. 24, 1983, Ser. No. 507,297
Int. Cl.³ E05D 13/02
U.S. Cl. 49—409 **6 Claims**

1. A horizontally sliding door adapted for two point hanging support on a building from a pair of horizontally spaced track-mounted trolleys from which releasable hanger brackets are suspended, said door comprising:

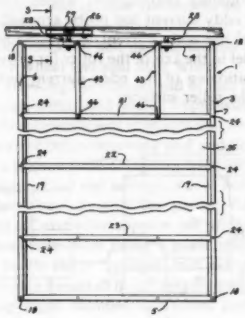
(a) a rectangular peripheral frame including elongated top, bottom and side rails of generally channel shape and with said rails being open and having spaced front and rear flanges joined by a web,

(b) the flanges of said top rail extending downwardly, and the web of said top rail receiving said hanger brackets thereon for connecting said top rail to said trolleys,

(c) a plurality of vertically spaced horizontal struts joined to and extending between said side rails,

(d) a siding panel mounted to the front flanges of said rails of said peripheral frame and with said panel providing a weight component offset forwardly of the central plane of the door,

(e) said siding panel offset weight component forming means



creating a twist component in said open top rail tending to pivotally pull said top rail front flange vertically downwardly with resultant vertical rising of said top rail rear flange at said hanger brackets so that said hanger brackets tend to release from said trolley,

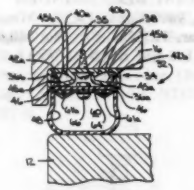
(f) and means disposed immediately adjacent said hanger brackets to hold said open top rail in place against said twisting component.

4,509,292

DOOR GASKET

Robert L. Konle, New Berlin, Wis., assignor to Arthur Smith Industries, Inc., New Berlin, Wis.

Filed Mar. 3, 1983, Ser. No. 471,881
Int. Cl.³ E06B 7/16
U.S. Cl. 49—499 **10 Claims**



1. An improved door gasket comprising:

a base having a pair of oppositely disposed catches rising therefrom and a pair of upstanding, opposing flanges;

a channel having a pair of depending, spaced apart latches, each said channel latch releasably engaging a corresponding one of said base catches when said channel is pressed against said base and each of said channel latches disengaging said corresponding one of said base catches when said channel is pried from said base; and

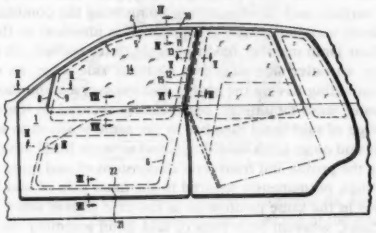
a strip of deformable gasket material having a pair of planar lateral edges, each said lateral edge is fastened to one of said latches to create a half-rounded deformable body having an interior void and each said lateral edge being held between the channel latch and one of said base flanges.

4,509,293

VEHICLE DOOR, IN PARTICULAR FOR PASSENGER MOTOR CAR

Martin Ufrecht, and Heinz Rest, both of Cologne, Fed. Rep. of Germany, assignors to Ford Motor Company, Dearborn, Mich.

Filed Jun. 13, 1983, Ser. No. 503,939
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227153
Int. Cl.³ B60J 5/04
U.S. Cl. 49—502 **7 Claims**



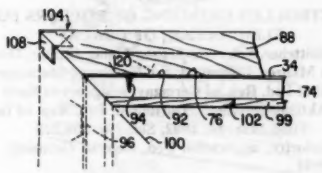
1. A vehicle door, in particular for motor cars which consists of at least an inner metal sheet and an outer metal sheet and in which these sheets are spot welded together along the door outer periphery and, in an upper frame part of the door, along the flanges around the opening area for a lowerable window, characterized in that the portions of the inner and outer sheets forming the upper frame part extend approximately normal to the plane of the glass of the lowerable window at their inner flanges, and extend parallel to the edges of the window glass at their outer flanges, the window glass being positioned to overlap the inner and outer flanges, thereby forming supporting channels mounting window glass guides and/or seals, and that the inner sheet forms an outwardly open shell which in the area of its upper frame part has a deep U-shaped cross-section profile which is closed by a shallow profiled region, approximately U-shaped in cross-section, formed on the outer sheet in the region of the upper frame part.

4,509,294

DOOR FRAME ASSEMBLY

Raynald Boilard, Comté Beauce Nord, Canada, assignor to Fernand Flamand Ltee, St.-Henri, Canada

Continuation of Ser. No. 183,450, Sep. 2, 1980, abandoned. This application Aug. 18, 1983, Ser. No. 524,231
Claims priority, application Canada, Jul. 4, 1980, 355503
Int. Cl.³ E06B 1/04
U.S. Cl. 49—504 **10 Claims**



1. A knocked down door frame comprising three factory made assemblies made of wood components and hardware means and designed to be readily mounted without shim means to a wall opening in a building, which opening is defined by a horizontal stud and two vertical spaced apart studs, said assemblies consisting of a lintel assembly adapted to be secured

adjacent said horizontal stud and two side post assemblies adapted to be secured to said vertical studs respectively, each side post assembly comprising a door jamb member of constant, generally rectangular cross-section having a main planar outer surface, an inner surface, an outer side edge and an inner side edge, an outer jamb moulding permanently secured along one of its margins to said outer side edge so as to substantially cover same and extend in the plane of said outer side edge away from said main planar outer surface, an inner jamb moulding permanently secured along one of its margins to said inner side edge so as to substantially cover same and extend in the plane of said inner side edge away from said main planar outer surface, said lintel assembly comprising the combination of a lintel member whose cross-section is identical to that of said door jamb member having a main outer surface, an inner surface, an outer side edge and an inner side edge, an outer lintel moulding having the profile and transverse dimensions of said outer jamb mouldings, permanently secured to the outer side edge of said lintel member in the same position as in the case of said outer jamb mouldings, and an inner lintel moulding having the profile and transverse dimensions of said inner jamb mouldings, permanently secured to the inner side of said lintel member in the same position as in the case of said inner jamb mouldings, wherein both ends of said lintel assembly are pre-cut at the point of manufacture at exactly 45 degree angles with respect to the main outer surface of said lintel member so as to produce miter ends, wherein the upper end of each side post assembly is pre-cut at the point of manufacture at an angle of exactly 45 degrees with respect to the main outer surface of the respective door jamb member so as to produce a miter end thereat, whereby at every miter end of each assembly every component thereof terminates in a commo plane which extends across the assembly at an angle of 45 degrees with respect to the corresponding main outer surface, wherein said inner surface of the door jamb member of each side post assembly and the inner surface of the lintel member of said lintel assembly have a longitudinally extending shallow, wide groove of rectangular cross-section extending at least in the region of every miter end and reaching the corresponding common plane, which groove is preferably disposed centrally of the width of the corresponding inner surface, wherein said hardware means comprises a rigid cross-piece for every miter end to be secured transversally of said groove so as to bridge same close to the corresponding miter end and an L-shaped clip to be mounted at each miter end of said lintel assembly, each L-shaped clip having a first and a second flat arms defining an angle of about 90 degrees, the first arm being adapted to be secured prior to erection of said door frame in the groove of said lintel assembly under said cross-piece with the second arm extending generally perpendicularly of the main outer surface of said lintel assembly away from said inner and outer lintel mouldings, said second flat arm being adapted to fit closely into the groove of the miter end of the adjacent side post assembly under the corresponding cross-piece upon erection of said door frame.

4,509,295

CONTROLLED GRINDING OF ROLLERS FOR ELIMINATION OF CRACKS

Wolfgang Böttcher, Schwerte-Ergste; Heinz Jüttner, Dortmund; Albrecht Maurer, Dortmund, and Ferdinand Stutzinger, Dortmund, all of Fed. Rep. of Germany, assignors to Estel Hoesch Werke Aktiengesellschaft, Dortmund, Fed. Rep. of Germany

Filed Mar. 18, 1982, Ser. No. 359,225

Claims priority, application Fed. Rep. of Germany, Apr. 1, 1981, 3112991

Int. Cl.³ B24B *5/00*

U.S. Cl. 51—49 **25 Claims**

1. A method for controlled grinding of roller surfaces comprising

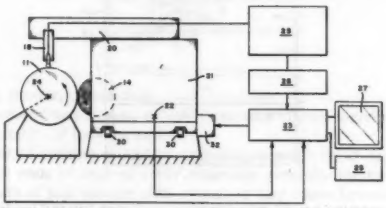
rotating a roller with a rotary drive;

rotating the grinding wheel having a rotation axis parallel to the rotation axis of the roller;

pressing the rotating grinding wheel against the rotating roller at a certain position along the axis of the roller;

moving the grinding wheel along the direction of its axis;

testing the surface of the roller with an eddy current test probe disposed at substantially the same position along the axis of the roller as the grinding wheel, however, staggered with respect to the grinding wheel by a suitable angle around the roller axis while the grinding wheel is rotating, mounting two support wheels having aligned axes on the eddy current test probe arm and disposed on each side of the eddy current test probe in a direction about parallel to the axis of the roller for providing proper relative positioning of the eddy current test probe with respect to the roller surface;



feeding a signal from the eddy current test probe to an eddy current test instrument;

converting an output from the eddy current test instrument with an analog-digital converter;

processing the signals from the eddy current test probe via an output of the analog-digital converter in a digital processor;

subdividing the circumference of the roller with a subdividing device connected to the digital processor;

subdividing the length of the roller with a subdividing device connected to the digital processor;

coordinating at least part of the roller surface with all sectors of said subdivided roller positively conforming to the surface of a picture screen connected to the digital processor.

4,509,296

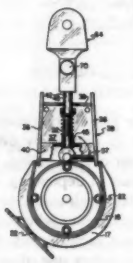
RADIAL BELT GRINDER

Aaron P. Rasmussen, 9606 Candy La., La Mesa, Calif. 92041

Filed Mar. 22, 1982, Ser. No. 360,607

Int. Cl.³ B24B *21/00*

U.S. Cl. 51—148 **6 Claims**



1. A radial belt grinder comprising:

a drive motor having a drive shaft;

a drive wheel mounted on said drive shaft;

a housing assembly for said drive wheel;

an idler wheel;

an idler wheel support bar having an upper and bottom end;

means for supporting said idler wheel laterally spaced from said housing assembly comprising a middle frame assembly having one end connected to said drive wheel housing assembly, an other end having the bottom end of said idler wheel support bar extending from it, an idler wheel case being supported on the upper end of said idler wheel support bar, said idler wheel case having bifurcated supporting arms that receive the end of an axle supporting said idler wheel;

a closed loop abrasive belt passing around the perimeter of said drive wheel and said idler wheel;

means for allowing the bottom end of said idler support bar to telescope within said middle frame assembly a predetermined distance sufficient to mount and remove said closed loop abrasive belt comprising said middle frame assembly having a surface plate extending transversely to said idler wheel support bar and having a bored hole through which said idler wheel support bar passes; following in axial sequence on said idler support bar after passing through said bored hole there being a guide stop, a compression spring, and a sleeve bushing; said sleeve bushing being telescopingly mounted in the bottom end of a transversely extending angle member that forms part of said middle frame assembly;

a cam shaft extending transversely to the lower end of said idler wheel support bar and having opposite ends journaled in said middle frame assembly, a cam being mounted on said cam shaft and said cam bearing against a lower end of said sleeve bushing, a cam handle being attached to said cam for rotating it between a position facilitating belt exchanges and a position limiting recoil when working pressures are applied to said idler wheel during contouring operations; and

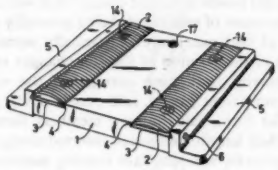
means for rotating said housing assembly with respect to said drive motor to various radial work positions.

4,509,297

SKI SHARPENER

Erik V. Lindgren, P1 1101, S-790 15 Sundborn, Sweden

Filed Oct. 19, 1982, Ser. No. 435,249
Claims priority, application Sweden, Oct. 21, 1981, 8106227
Int. Cl.³ A63C *11/06*; B23D *67/12*
U.S. Cl. 51—181 R **12 Claims**



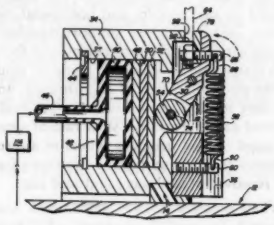
1. A device for sharpening the edges and scraping the base of skis, comprising a substantially plate-shaped holder body, which on one side thereof carries two parallel and spaced apart file blades arranged in the same plane, and which on the opposite side thereof carries a cutting blade arranged in the transverse direction of said file blades and substantially crosswise to the plane of the file blades, adjustment means to vary the distance of the cutting blade edge from the holder body surface along the cutting blade.

4,509,298

PNEUMATIC CLAMP MOUNTING FOR A DISC

Harold R. Klievoneit, Mesa, Ariz., assignor to St. Florian Company, Ltd., Phoenix, Ariz.

Filed Jul. 21, 1982, Ser. No. 400,303
Int. Cl.³ B25B *5/00*
U.S. Cl. 51—237 R **7 Claims**



1. A pneumatic clamp apparatus for retaining an apertured disc upon a shaft during grinding and polishing of the disc, said apparatus comprising in combination:

(a) an hub for penetrably engaging and supporting the disc, said hub including an annular cavity;

(b) an annular shoulder for locating the disc upon the hub;

(c) a plurality of clamps for clamping the disc upon said hub;

(d) means for biasing each clamp of said plurality of clamps;

(e) means for pivotally mounting each of said clamps;

(f) pneumatic means for urging pivotal movement of said plurality of clamps, said pneumatic means including an annular bladder operatively associated with said annular cavity and means for operating said plurality of clamps in response to inflation and deflation of said bladder; and

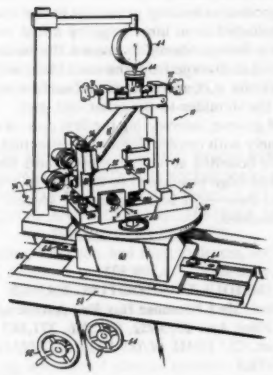
(g) means for slidably locating and rotationally locking said hub upon the shaft.

4,509,299

MEANS FOR REFACING A FUEL NOZZLE AND METHOD THEREOF

Joseph R. Guertin, Bristol, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sep. 27, 1982, Ser. No. 424,666
Int. Cl.³ B25B *5/00*; B24B *19/00*
U.S. Cl. 51—237 R **3 Claims**



1. In combination, apparatus for refacing the face of a fuel nozzle that has a threaded section that is to be replaced in a gas turbine engine, and a gage for orienting the face in a given spatial orientation, a retractable cap having a flat top surface threadably engaging said threaded section, said fuel nozzle

having a central axis comprising a base for being supported in a grinding machine adapted to move the base longitudinally and laterall, an upstanding support member for supporting said fuel nozzle for placing said face in position for being grinded by the grinding wheel of said grinding machine, a horizontal support member having a pivot pivotally supporting it to said base for being adjusted in a first plane so that said gage bears against said surface so that said face is oriented in spatial relationship to be square with respect to the pitch diameter of threads formed on said nozzle; said horizontal member pivotally supporting said upstanding support member so that said gage bears against said surface to orient said face in a second plane that is transverse to said first plane to square said face relative to the pitch diameter of said threads, and means for imparting rotary motion to said base so that said face rotates about its central axis at a relative slow rate of speed relative to the rate of speed of said grinding wheel in a direction that is opposite relative to the direction of rotation of said grinding wheel upon removal of said gage and said cap.

4,509,300

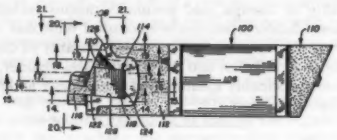
VANE RETENTION APPARATUS FOR ABRASIVE BLASTING MACHINE

James H. Carpenter, and Donald G. Corderman, both of Hagerstown, Md., assignors to Kennecott Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 245,028, Mar. 18, 1981, Pat. No. 4,402,163. This application Mar. 18, 1982, Ser. No. 359,411

Int. Cl.³ B24C *5/06*

U.S. Cl. 51—435 **13 Claims**



1. A throwing vane for a particular throwing device, said vane comprising:

a vane blade:

a base secured to the vane blade, said base having an inner end and outer end spaced along an axial direction and situated such that the vane blade extends between the two ends, said base defining a recess at the outer end thereof, said recess comprising:

a first groove extending generally in the axial direction and bounded at an inner edge by a first surface which extends from a shoulder toward the inner end and is oriented to diverge from the vane blade in the direction of the inner end, and by a second surface which extends from the shoulder to the outer end; and

a second groove, intersecting the first groove and oriented obliquely with respect to the axial direction, said second groove bounded at one edge by a third surface having an outer edge positioned to one side of the vane blade and an inner edge intersecting the second surface near the shoulder.

4,509,301

MODULAR SHOOTING RANGE

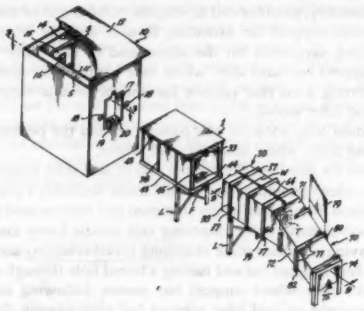
Robert L. Head, 3501 Perenosa Bay Dr., Anchorage, Ak. 99515

Filed Apr. 23, 1982, Ser. No. 371,342

Int. Cl.³ E04H *14/00*; **F41J** *1/12, 1/14*

U.S. Cl. 52—79.8 **9 Claims**

1. A firing tube for use in a shooting range comprising a generally tubular liner of metal sheet material, and panels for forming an outer sleeve completely encircling said liner, said liner having stiffeners projecting outward therefrom for supporting said panels spaced from the tube of said liner leaving room for filler material between said sleeve and said tube, and said liner including laterally spaced, upright sidewalls, integral flanges bent inward from the upper portions of said sidewalls,



respectively, and interconnected so as to form a ceiling and a floor plate for extending generally between the lower portions of said sidewalls.

4,509,302

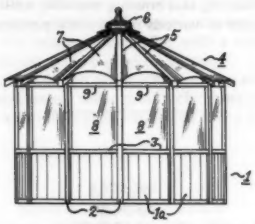
BUILDING STRUCTURE

Eugene R. Donatelli, 660 Taconic Trail, Williamstown, Mass. 01267

Filed Sep. 27, 1982, Ser. No. 424,007

Int. Cl.³ E04B *7/00*

U.S. Cl. 52—82 **4 Claims**



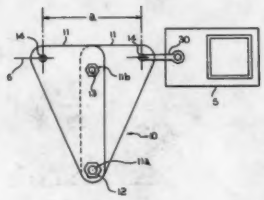
1. A building structure for a solarium or the like, comprising, in combination, a plurality of panels formed of stiff, outwardly bowed, transparent sheet members arranged adjacent one another in substantially radial array, and elongated spaced framing members extending along the adjacent sides of said panels holding said panels in bowed condition in said array, the form and arrangement of said panels being generally such that some portions of said panels are substantially normal to the rays of the sun as the position of the sun changes relative to said panels, thereby facilitating passage of the sun's rays through said transparent panels, said panels being generally triangular in flat form, said framing members formed with grooves along their length, said panels inserted along their side edges in said grooves, whereby said framing members firmly hold said panels in outwardly bowed position, the dimensions of said grooves in cross-section being sufficiently greater than the thickness of said panel edges to allow variation of the position of said panel side edges in said grooves along the length thereof, the opposite side walls of said grooves being convergent, said grooves being substantially triangular in cross-section, said panels having straight side edge portions inserted along their length in said grooves, said opposite side walls converging outwardly and holding said inserted panel edge portions in substantial sealing relation therewith.

4,509,303

OVERLOAD PROTECTOR FOR GUYED STRUCTURES

Ronald E. Randle, and Arnold M. Milbright, both of Red Wing, Minn., assignors to International Telephone and Telegraph Corp., New York, N.Y.

Filed Mar. 3, 1983, Ser. No. 471,824
Int. Cl.³ E04B *1/00*
U.S. Cl. 52—98 **14 Claims**



1. A device for serial connection in a guy arrangement comprising:

a first plate adapted for coupling to said guy arrangement and having first and second apertures spaced apart a first predetermined distance;

a second plate adapted for coupling to said guy arrangement and having third and fourth apertures spaced apart said first predetermined distance;

a hinge bolt extending through said first and third apertures to pivotally couple said first and second plate;

a shear bolt extending through said second and fourth apertures to couple said first and second plates;

said hinge bolt and said shear bolt cooperatively holding said first and second plates in a fixed position relative to each other when forces exerted on said device are below a predetermined level, and said plates shearing said shear bolt when said forces are equal to or exceed said predetermined level whereby said first and second plates pivot around said hinge bolt to add a predetermined length to said guy arrangement.

4,509,304

METHOD AND APPARATUS FOR INSERTING INSULATION IN PREEXISTING BUILDING STRUCTURES

Jack R. Epes, 520 North First St., Lompoc, Calif. 93436

Filed May 19, 1983, Ser. No. 495,947
Int. Cl.³ E04F *21/06*
U.S. Cl. 52—127.3 **15 Claims**

1. A device for installing batts of insulation in preexisting structures, comprising:

a control sheet having a substantially flat elongated surface for receiving a bat of insulation, a first end having a handle, and a second end which is free for insertion into a wall opening;

a compressor sheet having a substantially flat elongated surface for overlying said control sheet flat surface to compress a batt of insulation therebetween; a first end having a handle, and having a second end which is free for insertion into a wall opening;

means for connecting said control sheet second end to said compression sheet second end such that said sheets are maintained a predetermined distance apart to compress a batt of insulation and said compressor sheet second end and said control sheet second end overlie one another; and

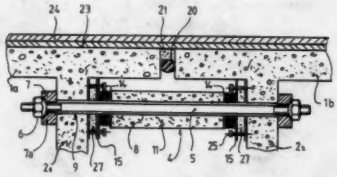
means for releasing said connecting means to release a batt of insulation after insertion into a wall opening.

4,509,305

DEVICE FOR CONNECTING ISOSTATIC ELEMENTS IN LINE

Pierre Guinard, Maintenon, France, assignor to Freyssinet International (STUP), Boulogne-Billancourt, France

Filed Feb. 15, 1983, Ser. No. 466,711
Claims priority, application France, Feb. 24, 1982, 82 03030
Int. Cl.³ E04C *3/10*
U.S. Cl. 52—223 R **4 Claims**



1. A device for connecting together the upper parts of adjacent, opposing butt ends of isostatic elements disposed in line with one another, comprising:

at least one tensioned tie rod having a longitudinal axis and being disposed between said upper parts of said opposing butt ends of said isostatic elements;

a pre-compressed member also disposed between said upper parts of said opposing butt ends of said isostatic elements, said pre-compressed member having a longitudinal axis and being brought into a state of substantially permanent pre-compression at least in part by said tie rod;

said tie rod being longitudinally coaxially disposed within and extending through said pre-compressed member; and

said pre-compressed member being a tubular cylinder filled with concrete and freely traversed by said tie rod.

4,509,306

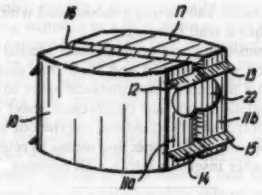
PANEL FOR SELF-SUPPORTING ROOF STRUCTURES COMPRISING ELONGATED EXTRUDED PROFILE ELEMENTS OF PLASTICS MATERIAL CLOSED AT THEIR ENDS, AND CLOSING MEMBER FOR SUCH PROFILE ELEMENTS

Henryk Sokoler, Roskilde, and Eigil Federsen, Jyllinge, both of Denmark, assignors to Everlite A/S, Skaevinge, Denmark

Filed Jul. 25, 1983, Ser. No. 512,341
Claims priority, application Denmark, Aug. 12, 1982, 3621/82
Int. Cl.³ E04B *1/70*
U.S. Cl. 52—302 **8 Claims**

5. A closing member of plastics material for closing a main duct in an elongated extruded profile element for a panel for roof structures which closing member has substantially the same profile as the wall of said profile element defining said main duct and with such dimensions that the closing member can fit into said main duct and substantially prevent free air circulation through said duct and which closing member fur-

ther has resilient sealing flaps along and issuing from two opposite lateral outer surfaces of said closing member, the free ends of the flapes facing the open end of the closing member;



each sealing flap extending over said lateral surface and being divided into two parts by a narrow slit which is closed when the closing member is in position in the end of the profile element.

4,509,307

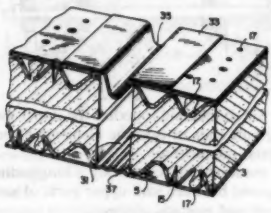
HEAT INSULATING PANEL

Emilien Beaudet, Chateauguay, Canada, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 321,272, Nov. 13, 1981,. This application Jul. 28, 1983, Ser. No. 517,912

Int. Cl.³ E04C *2/24*

U.S. Cl. 52—309.4 **4 Claims**



1. In a composite roofing panel, the combination of an insulating core of polymeric foam, the core having

an upper surface,

a lower surface,

two oppositely disposed edge surfaces, and

an elongated slit extending between and opening through said edge surfaces and also opening along its length through one of the upper surface and the lower surface;

at least one lamina of non-foam material overlying and secured to said one of the upper and lower surfaces;

said at least one lamina being interrupted by the slit;

an elongated flexible transversely strong tape covering the slit and adhesively secured to the portions of said at least one lamina of non-foam material adjacent the slit,

the slit presenting side walls which are spaced apart when the tape is relaxed and undeformed; and

at least one additional lamina of non-foam material overlying and secured to the other of the upper and lower surfaces and extending in unbroken fashion across the location of the slit;

the slit affording space for relief of stresses resulting from shrinkage of the insulating core of polymeric foam due to uneven loss of moisture and thereby inhibiting curling of the panel which would otherwise result from such stresses;

the tape providing supplemental structural strength to allow handling of the panel despite presence of the slit, yet also allowing limited movement of the side walls of the slit relative to each other as said stresses are relieved.

4,509,308

MOUNTING ASSEMBLY AND METHOD FOR INSTALLING DOWELS IN COMPOUND PANELS

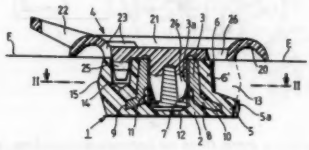
Karl Dettfurth, and Bernd Dettfurth, both of Hamburg, Fed. Rep. of Germany, assignors to Messerschmitt-Boelkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Mar. 28, 1983, Ser. No. 479,571

Claims priority, application Fed. Rep. of Germany, Apr. 8, 1982, 3213213

Int. Cl.³ E04C *2/54*

U.S. Cl. 52—787 **9 Claims**



1. A mounting assembly having a central axis, for installing a dowel in a hole in a compound panel, comprising a dowel body with a central hole, a threaded bushing rigidly held in said central hole, said dowel body having anchoring elements and at least one flange, said assembly further comprising a mounting member (**4, 50**) removably connected to an outer end of said dowel body, said mounting member having a curved margin (**20, 52**) forming a casting depression (**21, 59**) around the outer end of the dowel body on the surface of a panel in which the assembly is to be installed, said dowel body having a cornered portion (**6, 45**) arranged centrally around said central axis, said flange (**5, 43**) of the dowel body merging into the cornered portion, said cornered portion having relatively flattened corners (**15**) defining a circle having a diameter larger than the diameter of a circle defined by said flange, said threaded bushing (**3, 42**) also having a flange (**8, 46**) reaching into said flange (**5, 43**) of the dowel body.

4,509,309

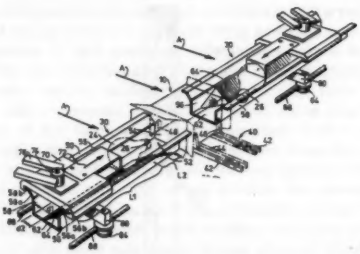
LOAD ORIENTING RECEPTACLES FOR CARTON LOADING MACHINES

Marinus J. M. Langen, and Peter Guttinger, both of Rexdale, Canada, assignors to H. J. Langen & Sons Limited, Mississauga, Canada

Filed Aug. 8, 1983, Ser. No. 520,906

Int. Cl.³ B65B *35/56, 39/14*

U.S. Cl. 53—142 **7 Claims**



1. A load orienting receptacle for a carton loading machine for use in loading lightbulbs into an open end of a carton, the lightbulbs being of the type having a bulbous end and a narrow plug end, comprising;

a trough having a slipway extending longitudinally thereof to an open discharge end,

said slipway having an open upper end for admitting a light-bulb to a load orienting portion thereof spaced inwardly from the discharge end,

said load orienting portion having opposite sides which converge downwardly to form a downwardly directed laterally inclined chute,

said opposite sides being spaced from one another a sufficient distance to support the bulbous end above the bottom of the trough while permitting the narrow end to be laterally deflected as it passes downwardly along the chute to come to rest in the trough thereby to laterally offset the narrow end with respect to the bulbous end of the bulb prior to discharge through the open discharge end of the trough.

4,509,310

APPARATUS FOR THE PRODUCTION OF PACKS, ESPECIALLY CIGARETTE CARTONS

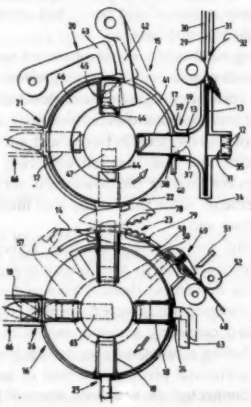
Heinz Focke, Verden, and Hugo W. Mutschall, Kirchlinteln, both of Fed. Rep. of Germany, assignors to Focke & Co., Verden, Fed. Rep. of Germany

Filed May 24, 1982, Ser. No. 381,478

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1981, 3123496

Int. Cl.³ B65B *11/32, 41/18*

U.S. Cl. 53—170 **10 Claims**



1. An apparatus for selectively wrapping groups of cigarette packs with first and second carton-forming wrapper blanks to form a carton of cigarette packs, and for discharging cartons wrapped in only the first wrapper blank, in only the second wrapper blank or in both the first and second wrapper blanks, said apparatus comprising:

first (**15**) and second (**16**) rotatable wrapping-and-folding turrets disposed one above the other with their rotational axes parallel to each other;

first feeding means for feeding first wrapper blanks (**13**) to said first turret (**15**);

second feeding means for feeding second wrapper blanks (**14**) to said second turret;

first discharge means in said first turret for discharging wrapped cartons at a first discharge station (**21**);

second discharge means in said second turret for discharging wrapped cartons at a second discharge station (**26**); and

wrapped carton receiving means (**66**), movable between said first and second discharge stations, for selectively receiving wrapped cartons from said first and second discharge stations.

4,509,311

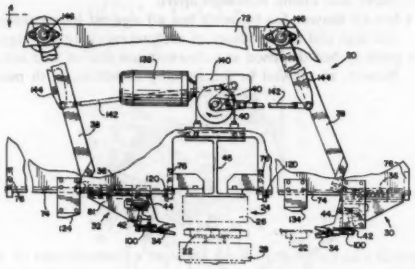
METHOD AND APPARATUS FOR LOADING AND UNLOADING PACKAGE-FORMING MACHINE

Carroll P. Hartl, Madison, Wis., assignor to General Foods Corporation, White Plains, N.Y.

Filed Sep. 25, 1981, Ser. No. 305,482

Int. Cl.³ B65B *7/06*

U.S. Cl. 53—202 **7 Claims**



1. In a package-forming machine having an apparatus for sealing a package cover to a food containing package tray, which apparatus includes a pair of sealing portions which are relatively movable between a spaced-apart position and a closed sealing position, the improvement comprising, in combination:

a pair of shuttles slidably mounted on opposite sides of the sealing portions and movable toward and away from the sealing portions;

each of the shuttles including at least a pair of sliding portions biased to a normally spaced-apart relationship;

a pair of gripping jaws carried by one of the sliding portions of each shuttle;

means for reciprocally moving each of the shuttles toward and away from the sealing portions, said moving means including a drive member attached to another of the sliding portions of each shuttle;

a stop defining the end of the movement of each shuttle toward the sealing portions, the stop being disposed to engage the jaw-carrying sliding portion;

jaw control means carried by the jaw-carrying sliding portion operable to move the gripping jaws of the respective shuttle between open and closed positions; and

means associated with said another sliding portion of each shuttle adapted to engage the respective jaw control means when the sliding portions of each shuttle are adjacent at the end of shuttle movement toward the sliding portions.

4,509,312

AUTOMATIC CARTON PACKING MACHINE

Mutsuhiko Nakajima, Soka, Japan, assignor to Ace Pak Company Incorporated, Japan

Division of Ser. No. 250,282, Apr. 2, 1981, Pat. No. 4,448,013. This application Aug. 16, 1983, Ser. No. 523,427

Int. Cl.³ B65B *57/00, 19/24*

U.S. Cl. 53—375 **2 Claims**

1. A device for treating the triangular lugs of carton tops to be packed and to have a flat top, in a process of packing enclosing the cartons, said device comprising:

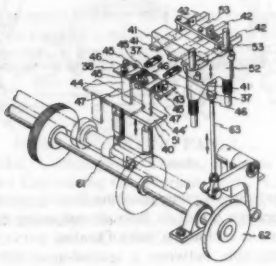
clamp conveyor means arranged at a right angle to a bucket conveyor, said clamp conveyor means provided for running intermittently in a timed relation to running of the bucket conveyor, and for running in a running direction;

a clamp set including a horizontal base plate attached to said clamp conveyor means, a back pushing plate attached to said base plate for pushing cartons in the running direc-

tion, said back pushing plate extending vertically, clamp members projecting from a lower side of said base plate, and a driven mechanism connected to said clamp members for moving said clamp members toward each other, said driven mechanism provided on said base plate and including a cam follower movable from an upper position to a lower position for actuating said driven mechanism to move said clamp members together, said cam follower movable upwardly to actuate said driven mechanism to move said clamp members apart;

a hot-air blower for blowing hot air against lower sides of the lugs and side surfaces of cartons carrying the lugs;

a push-up bed disposed at a downstream side of said hot-air blower, as viewed in the running direction, with means



connected to said bed for pushing a carton up toward said base plate; and

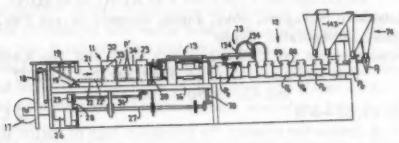
a clamp cam having a closing surface positioned to engage said cam follower with movement of said clamp conveyor means to move said cam follower downwardly, and an opening surface downstream of said closing surface in said running direction for moving said cam follower upwardly whereby said push-up bed is moved upwardly to move triangular lugs of a carton against said clamp members and said clamp conveyor means is movable in the running direction to move said clamp members together to clamp against the lugs and to hold the carton, said clamp conveyor means being further movable in the running direction to move said clamp members apart to release the carton.

4,509,313

POUCH FORMING AND FILLING APPARATUS

Robert G. Koppe, 4243 Dickman Rd., Apt. 3C, Battle Creek, Mich. 49015

Division of Ser. No. 106,124, Dec. 21, 1979, Pat. No. 4,353,198.
This application Jun. 9, 1982, Ser. No. 386,815
Int. Cl.[3] B65B *43/34, 43/30*
U.S. Cl. 53—570 **4 Claims**



1. An apparatus for filling a pouch having an openable mouth, comprising:

a frame;

a pouch-supporting mechanism for supporting a preformed pouch so that the mouth thereof opens upwardly;

filling means positioned above said pouch for permitting selected material to be deposited into said pouch through the open mouth thereof, said filling means including a filling member having a lower portion which is positionable adjacent the mouth of said pouch and defines a downwardly directed discharge opening for permitting discharge of said material into said pouch; and

a centering mechanism for engaging the mouth of said pouch and holding same in an opened and centered relationship relative to the discharge opening of said filling member, said centering mechanism including a pair of horizontally elongated pouch-engaging elements which are pivotally mounted adjacent one end thereof and are free adjacent the other end thereof, the free ends of said elements defining downwardly projecting portions which are adapted to project into the pouch mouth for engagement with the opposite sidewalls of the pouch, said pouch-engaging elements being normally maintained in a raised position wherein said free ends are disposed directly adjacent one another and are positioned vertically between said discharge opening and the mouth of said pouch, said pouch-engaging elements being moved into a lowered centering position wherein the free ends of said elements project into the open mouth of said pouch and are horizontally spaced a substantial distance from one another for engaging the opposite sidewalls of the pouch in the vicinity of the mouth thereof, said pouch-engaging elements during movement from said raised to said lowered centering position being moved through an intermediate lowered position wherein said free ends of said elements project into the open mouth of said pouch but are still maintained closely adjacent one another;

said centering mechanism including swivel means mounting said one ends of said pouch-engaging elements for permitting both vertical swinging of said elements between said raised and intermediate lowered positions and horizontal swinging of said elements between said intermediate lowered position and said lowered centering position, and stop means for limiting the downward vertical swinging of said elements when they reach said intermediate lowered position; and

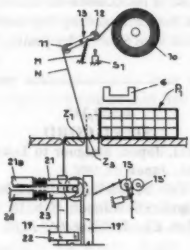
said centering mechanism including activating linkage means interconnected to said pouch-engaging elements for effecting movement thereof from said raised position into said intermediate lowered position and thence into said lowered centering position, said activating linkage means including a pivot member swingable about a substantially horizontal pivot axis, a pair of activating links pivotally connected at one ends thereof to said pivot member and respectively individually pivotally connected at the other ends thereof to said pouch-engaging elements at locations spaced intermediate the ends thereof, and actuating means interconnected to said pivot member for effecting swinging movement thereof from a first end location through an intermediate location into a second end location, whereby swinging movement of said pivot member from said first end location to said intermediate location acts through said activating links for swinging said pouch-engaging elements downwardly from said raised position into said intermediate lowered position until limited by said stop means, whereupon further swinging of said pivot member from said intermediate location toward said second end location acts on said activating links to cause said pouch-engaging elements to be swung outwardly away from one another into said lowered centering position wherein the free ends of said elements engage the opposite sidewalls of the pouch to hold the mouth open in centered relationship to the discharge opening of the filling member.

4,509,314

BAND WRAPPING MACHINE FOR THE PACKAGING OF PARCELS OF BOXES OR PRODUCTS

Ireneo Bozza, Via Stoppato, 9, Bologna, Italy

Filed Mar. 24, 1982, Ser. No. 361,138
Claims priority, application Italy, Jul. 17, 1981, 3483 A/81
Int. Cl.[3] B65B *11/08, 13/22*
U.S. Cl. 53—586 8 Claims



1. Band wrapping machine for the packaging of parcels of boxes or products, comprising in combination:

thrust means for sliding the parcels across a horizontal surface from a packaging position to a fastening position in which they are fastened by a heat-sealing material web initially extending vertically with respect to said surface and passing through a first transverse slit;

an operating device for welding and cutting the web once the wrapping of the package has been completed to form a seal on the wrapped package and on the vertically extending film, said operating device acting through a second slit parallel to said first one and placed downstream thereof;

a reel of said wrapping material, placed above said horizontal surface and rotating around a horizontal axis parallel to the said slits to feed said material in a feeding direction to said first slit;

a web storage roller, located beneath, and parallel to said first slit around which said web is wound, in the region of the lower generatrices and at an angle close to one half circle turn,

bilateral guide means, said web storage roller being movable vertically and freely under the influence of gravity along said bilateral guide means, between two extreme positions, namely an extreme upper position with said web tightened and shrouded around the parcel, and an extreme lower position for taking up and unwinding the wrapping material from the reel and downwardly move said seal on the vertically extending film out of the path of the next parcel; and

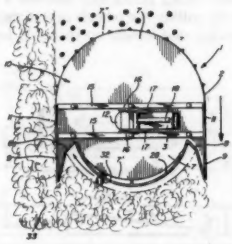
a device for locking the web issuing from the web storage roller and preventing said wrapping material from moving in the direction opposite said feeding direction, means for mounting said device underneath said horizontal surface at a height in between said horizontal surface and said web storage roller when said storage roller is in said lower position, means for actuating said device to move said film in said film feeding direction only each time the web is unwound from the reel, following the return of said web storage roller to the extreme lower position to further downwardly move the seal on the vertically extending film sufficiently so that no seal is present in the film for the next parcel.

4,509,315

BUSHWOOD MOWING APPARATUS

Noëlli Giguere, St-Adrien de Ham (Richmond), Quebec J0A 1C0, Canada

Filed Nov. 28, 1983, Ser. No. 555,772
Int. Cl.[3] A01D *35/262*
U.S. Cl. 56—10.7 5 Claims



1. In combination, a mowing device consisting of a floating work head and a work-related vehicle, comprising: a multiple-lever arm to movably manipulate said work head against bush to be mown; said head comprising a housing having a top wall with semi-circular front and rear ends, lateral walls and a rear wall, a motor fixedly secured to said top wall and having a shaft extending through said top wall below the same, an elongated flat rigid bar fixed to said shaft at its center and rotatable in a plane parallel to the plane defined by said top wall, a cutting blade pivoted to each end of said bar and defining a full cutting arc outwardly of said front end but inwardly of said rear end; said front end having two end portions projecting forwardly outwardly from said cutting arc and defining inner indents adapted to retain said bush to be mown therewithin upon forward progression of said work head; said bar defining slashing and comminuting leading edges, each cutting blade mounted on said bar at its inner end portion for full rotation in a plane parallel to said bar about a pivotal member protruding from the top of said bar and from the bottom of said blade, each of said blades having a free end portion parallel to said bar and which is downwardly offset from said blade inner end portion to fully shield the lower end of said pivotal member, wherein said bush slidingly brought within said indent is shearingly struck by one said blade which may yieldingly pivot inwardly depending upon the resistance of said bush and is thereafter struck by the other said blade which may also yieldingly pivot inwardly and again by the said one blade having outwardly pivoted under centrifugal force which may again pivot inwardly, sucessively, until the bush is completely cut, and the leading edges of said bar subsequently slash and comminute the cut bush.

4,509,316

LAWN MOWER SHARPENER

Jack F. Edwards, 4917 Harrison Dr., Holiday, Fla. 33590

Filed Aug. 3, 1984, Ser. No. 637,609
Int. Cl.[3] B24B *19/00*
U.S. Cl. 56—250 10 Claims

6. An improved rotary, power lawn mower sharpener, comprising:

a base member having a pivot mounted thereon;

a lever pivotally mounted on said pivot for horizontal motion about said pivot, having a handle connected thereto for actuating said lever;

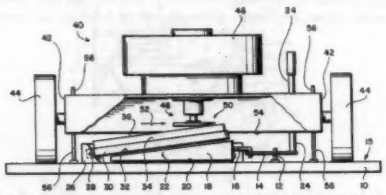
a wedge having a horizontal, planar, bottom surface for sliding engagement with said upper surface of said base, and having an inclined, planar, upper surface, said wedge connected to said lever, said lever acting to displace said wedge in a horizontal direction;

a tray member pivotally mounted to said base by means of a horizontal pivot, said tray having a planar, bottom surface

adapted for sliding engagement with said inclined, upper surface of said wedge when said wedge is moved horizontally by said lever;

a grinding stone mounted in said tray, having an upper, planar grinding surface which is raised when said wedge moves inwardly beneath said tray and which is lowered when said wedge is moved outwardly from beneath said tray;

said base member being positioned beneath a rotary power lawn mower by rolling the wheels of said mower over said base and moving said handle so that said lever pulls said



wedge outwardly from beneath said tray member, lowering said grinding stone so that said upper surface thereof clears the bottom edge of said mower;

said mower having a rotary blade with a leading edge which is to be sharpened, said blade being driven into horizontal motion by means of its motor, said blade being sharpened by moving said handle so that said lever pushes said wedge inwardly beneath said tray member, raising said grinding stone so that said upper surface thereof operatively contacts the lower surface of said leading edge of said blade at an inclined angle;

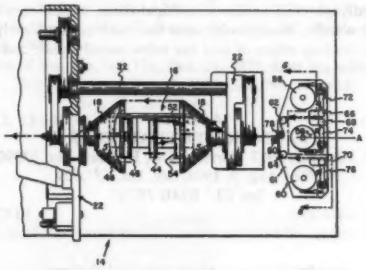
whereby said blade is conveniently and safely sharpened.

4,509,317

APPARATUS AND METHOD FOR MAKING METALLIC CORD

Carl Rogister, Colmar-Berg, Luxembourg, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Apr. 25, 1983, Ser. No. 488,492
Claims priority, application Luxembourg, May 7, 1982, 84135
Int. Cl.³ D07B *3/12, 3/02*
U.S. Cl. 57—58.32 **28 Claims**



1. A method for producing metallic cords adapted to be used as reinforcing members in elastomer structures having a first element of two or more parallel filaments brought together with a second element of one or more filaments, the method comprising the steps of:

withdrawing a first group of filaments at a pre-determined tension from the plurality of fixedly located delivery spools and applying a turn through the first group of filaments forming the first element;

withdrawing one or more filaments forming a second element at a predetermined tension from one or more fixedly located delivery spools;

directing the second element along an axis of rotation on which the turn is applied;

bringing the first and second elements together while maintaining the predetermined tensions respectively thereon to helically form one element with respect to the other by application of the turn on the first element, formed of the first group of filaments, to the second element, formed of one or more filaments, which second element has received no turns because of its location on the axis of rotation; and

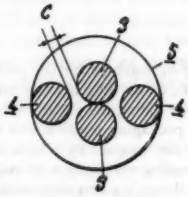
subsequently mechanically setting the cord formed above to set the cord structure formed by joining the two elements together.

4,509,318

STEEL CORD

Osamu Yoneda, Miki, Japan, assignor to Tokusen Kogyo Kabushiki Kaisha, Ono, Japan

Filed Feb. 3, 1984, Ser. No. 576,922
Claims priority, application Japan, Feb. 10, 1983, 58-18628[U]
Int. Cl.³ D07B *1/06, 1/10*
U.S. Cl. 57—212 **2 Claims**



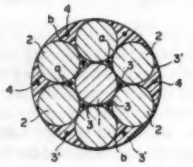
1. A steel cord composed of four material wires of the same diameter which are intertwisted, of which two material wires are stuck to each other and intertwisted at the center and each of the other two material wires is arranged on both sides of the former two material wires with a certain space left therebetween and the latter two material wires are twisted about the former two material wires in the same twist direction and at the same pitch as the former two material wires.

4,509,319

WIRE ROPE

Tatsuo Yoshida; Kikuo Fukuda, both of Kakogawa, and Akihiko Tomiguchi, Nabari, all of Japan, assignors to Shinko Kosen Kogyo Kabushiki Kaisha, Amagasaki, Japan

Continuation of Ser. No. 324,664, Nov. 24, 1981, abandoned.
This application Aug. 20, 1984, Ser. No. 641,931
Claims priority, application Japan, Dec. 27, 1980, 55-188642
Int. Cl.³ D07B *1/14, 1/08, 5/00*
U.S. Cl. 57—218 **2 Claims**



1. A wire rope comprising:

a core rope;

a plurality of outer strands, including outermost strands, laid on the circumference of said core rope, said outermost

strands having gaps formed therebetween and forming a plurality of first interstices between said core rope and said respective outermost strands and a plurality of second interstices formed between said outermost strands at positions radially outside of said gaps;

means for maintaining flexibility of said rope without cracking and peeling, said means for maintaining comprising a flexible filler element of a thermoplastic material formed as an integral body independently disposed in each of said first interstices formed between said core rope and said outermost strands, and in each of said gaps and second interstices between the individual outer strands, each said filler element being preformed with a shape corresponding to that of an interstice in which said filler element is disposed; and

a reinforcing core embedded in at least said filler element disposed in a respective one of said first and second interstices.

4,509,320

ELASTIC COVERED YARN AND METHOD AND APPARATUS FOR PRODUCING THE SAME

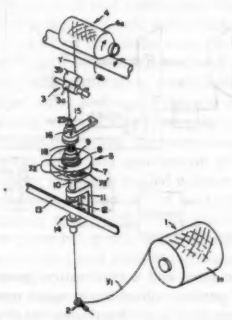
Senichi Maeda, 462 Shinhakusuimaru-cho, Ichijyo-Sagaru, Chiekoindori, Kamigyo-ku, Kyoto, Japan

Filed Mar. 18, 1983, Ser. No. 476,608

Claims priority, application Japan, Apr. 5, 1982, 57-57086; Jul. 16, 1982, 57-124615

Int. Cl.³ D02G *3/32*

U.S. Cl. 57—225 **4 Claims**



1. A method of producing an elastic covered yarn capable of stretching and contracting from its stretched condition, said method comprising the steps of:

(a) feeding a non-elastic yarn at a constant speed in one direction as a core yarn over a straight portion of the length thereof while applying a predetermined tension force thereto;

(b) at the same time, continuously wrapping an elastic yarn around said straight portion of said non-elastic yarn as said non-elastic yarn is fed thereover under a predetermined tension, and while applying a stretching force to the elastic yarn at said straight portion as it is being wrapped; and

(c) releasing the tensioning force from the non-elastic yarn and the stretching force from the elastic yarn after they have been moved past said straight portion;

(d) whereby to permit the covered yarn to contract after passing the straight portion so that the elastic yarn which when stretched was the cover yarn upon contraction becomes the core yarn and the non-elastic yarn which when tensioned was the core yarn upon release of tensioning becomes the cover yarn, softly and substantially covering the released elastic yarn, with no twist and with the non-elastic yarn being prevented from any substantially additional stretching.

4,509,321

APPARATUS FOR MANUFACTURING FASCIATED YARN

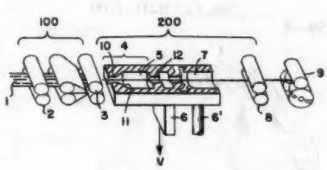
Koji Kajita, Omihachiman; Takashi Nakayama, and Seiichi Yamagata, both of Otsu, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed May 4, 1983, Ser. No. 491,414

Claims priority, application Japan, May 4, 1982, 57-73340; May 4, 1982, 57-73336

Int. Cl.³ D01H *5/28*

U.S. Cl. 57—328 **24 Claims**



1. A fasciated yarn spinning apparatus having a drafting section, a false-twisting section and a delivery section, characterized in that said false-twisting section is adapted to produce a false-twisted core and a plurality of outside fibers, said apparatus including a fiber-diffusing section using a suction fluid between the final nip point in said drafting section and said false-twisting section, said fiber-diffusing section being arranged to control the path of movement of outside fibers to cause the outside fibers to return in a uniform manner alongside the false-twisted core.

4,509,322

FALSE TWIST UNIT

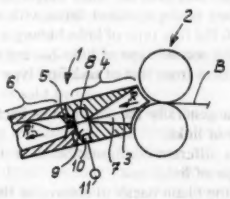
Emil Briner, and Richard Hieronymi, both of Winterthur, Switzerland, assignors to Rieter Machine Works Limited, Winterthur, Switzerland

Filed Mar. 28, 1984, Ser. No. 594,240

Claims priority, application Switzerland, Apr. 12, 1983, 1961/83

Int. Cl.³ D01H *5/28*; D02G *1/04*

U.S. Cl. 57—333 **13 Claims**



1. A false twist unit for threads or the like having a predetermined direction of thread movement, in particular for false twist spinning, comprising:

a suction portion containing a converging suction channel including a throat portion;

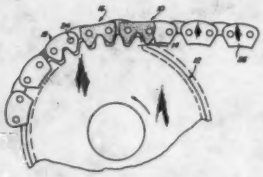
means defining a throttle location following said converging suction channel considered with respect to the predetermined direction of thread movement;

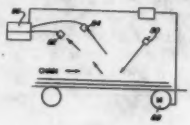
twist imparting means following the suction portion with respect to said predetermined direction of thread movement;

said suction portion further containing an expansion space which is in flow communication with the suction channel and located forwardly of the throttle location so that the suction channel opens at its throat portion into said expansion space;

means defining an air exit for said expansion space;
means defining a source of negative pressure; and
said expansion space being connected by said air exit to said source of negative pressure.

4,509,323
POWER TRANSMISSION CHAIN
Timothy J. Ledvina, and Robert H. Mead, both of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.
Division of Ser. No. 332,032, Dec. 18, 1981, abandoned. This application Oct. 28, 1983, Ser. No. 546,669
Int. Cl.³ B21L *3/00*
U.S. Cl. 59—8 **6 Claims**

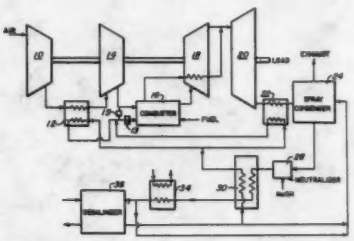




1. A method for differentiating between two types of links in a chain adapted for use in a sprocket drive and in which the links drivingly engage the teeth of the sprockets, the chain being composed of pivotable, interconnected and interleaved sets of links, each of said links having a pair of toes defined by converging flanks and a back surface opposite said toes, said chain further being composed of a first type of links and a second type of links both of which drivingly engage the teeth of the sprockets of the sprocket drive with at least one of the flanks thereof, the first type of links having a first flank configuration and the second type of links having a flank configuration which differs from that of said first type of links, comprising:
providing a generally flat and planar back on each link of one type of links;
providing a different configuration back on each link of the other type of links; and
inspecting the chain backs to determine the locations of the two types of links.

4,509,324
DIRECT OPEN LOOP RANKINE ENGINE SYSTEM AND METHOD OF OPERATING SAME
Herman B. Urbach, Rte. 2, 1355 Tydings Rd., and Earl R. Quandt, 203 Winchester Rd., both of Annapolis, Md. 21401
Filed May 9, 1983, Ser. No. 492,860
Int. Cl.³ F02C *1/06, 6/00, 7/00, 7/08*
U.S. Cl. 60—39.17 **8 Claims**

1. An open-cycle Rankine engine system, said open-cycle Rankine engine system having a predetermined power profile curve, comprising:
first compression means for receiving ambient air and outputting a first compressed air flow mass;
cooling means cooperating with said first compression means for extracting a thermal energy of compression from said first compressed air flow mass and outputting a cooled, compressed air flow mass;
second compression means for receiving said cooled compressed air flow mass and outputting a second compressed air flow mass, and wherein said second compressed air flow mass is variable over a range from a predetermined maximum compressed air flow mass to a predetermined compressed minimum air flow mass;
combustion means optimized for stoichiometric combustion of said predetermined maximum compressed air flow mass at a maximum specific horsepower point of said predetermined power profile curve to generate combustion products, said combustion means further optimized to operate at a predetermined maximum combustion temperature during said stoichiometric combustion at said maximum specific horsepower point and wherein said predetermined maximum combustion temperature remains substantially constant over a 4-to-1 power turndown ratio between said maximum specific horsepower point and a Simple Cycle point along said predetermined power profile curve to form said combustion products, such that said combustion means operates at a maximum combustion efficiency at said maximum specific horsepower point and over said 4-to-1 power turndown ratio without flame out and said maximum predetermined compressed air flow mass required during stoichiometric combustion is minimized;
injection means for injecting a predetermined mass of steam-water into said combustion means to form a low tempera-



ture steam mass and a combustion gases-steam working fluid, said predetermined steam-water mass being variable over a range from a predetermined maximum steam-water mass to a predetermined minimum steam-water mass, and wherein said predetermined steam-water mass is injected into said combustion means and mixes with said combustion products to form said combustion products-steam working fluid;
first expansion means optimized for receiving and expanding said low temperature steam mass and said combustion gases-steam working fluid to generate a first output power for powering said second and first compression means and outputting an expanded combustion products-steam working fluid, said first expansion means further optimized to operate at a predetermined maximum inlet temperature at said maximum specific horsepower point and wherein said predetermined maximum inlet temperature remains substantially constant over said 4-to-1 power turndown ratio between said maximum specific horsepower point and said Simple Cycle point along said predetermined power profile curve without choking and said first expansion means is cooled by flow of said low temperature steam mass therethrough;
second expansion means for receiving and expanding said expanded combustion products-steam working fluid to generate a second output power for powering a variable load and outputting a combustion products-steam exhaust fluid;
means for regulating said predetermined steam-water mass,

said second compressed air flow mass, and a fuel introduced into said combustion means, said regulating means adapted to introduce said predetermined maximum steam-water mass, said predetermined maximum compressed air flow mass and said fuel into said combustion means in a first predetermined manner to cause said stoichiometric combustion at said maximum specific horsepower point of said predetermined power profile curve, said regulating means further adapted to vary said fuel and said predetermined steam-water mass introduced into said combustion means in a second predetermined manner, said predetermined steam-water mass being varied between said predetermined maximum steam-water mass and said predetermined minimum steam-water mass, to cause said open-cycle Rankine engine system to operate along said predetermined power profile curve over said 4-to-1 power turndown ratio between said maximum specific horsepower point and said Simple Cycle point such that said predetermined maximum combustion temperature and said predetermined maximum inlet temperature remain substantially constant over said 4-to-1 power turndown ratio and a thermal efficiency of said open-cycle Rankine engine system increases as it operates along said predetermined power profile curve from said maximum specific horsepower point to a Cheng point, and wherein said regulating means is further adapted to vary said fuel and said second compressed air flow mass, said second compressed air flow mass being varied between said predetermined maximum compressed air flow mass and said predetermined minimum air flow mass, in a third predetermined manner for operation of said open-cycle Rankine engine system below said Simple Cycle point such that an inlet temperature of said first expansion means is less than said predetermined maximum inlet temperature; and

means for treating said combustion products-steam exhaust fluid to recover water and waste thermal energy therefrom, said treating means further comprising

first heat exchanging means for extracting said waste thermal energy from said combustion products-steam exhaust fluid to produce a cooled exhaust fluid,

means for condensing water out of said cooled exhaust fluid to produce adulterated water and exhaust gases, said exhaust gases being exhausted to said ambient air,

means for neutralizing said adulterated water to produce neutralized water,

second heat exchanging means for cooling said neutralized water to produce cooled neutralized water, and

means for desalinizing said cooled neutralized water to produce fresh water,

wherein said fresh water cooperates with said second heat exchanging means to form preheated fresh water and a first portion of said preheated fresh water cooperates with said first heat exchanging means to extract said waste thermal energy therefrom to form a first steam-water mass and a second portion of said preheated fresh water cooperates with said cooling means to extract said thermal energy of compression therefrom to form a second steam-water mass such that said first steam-water mass and said second steam-water mass combine to form said predetermined steam-water mass;

whereby said open-cycle Rankine engine system is optimized for full-load operation at said maximum specific horsepower point, for a first part-load operation along said predetermined power profile curve between said maximum specific horsepower point and said Simple Cycle point over said 4-to-1 power turndown ratio, and for a second part-load operation below said Simple Cycle point to significantly reduce fuel consumption of said open-cycle Rankine engine system over an integrated, weighted full load-part load operating cycle thereof and wherein a total volume of said open cycle Rankine engine system is reduced by approximately fifty percent.

4,509,325

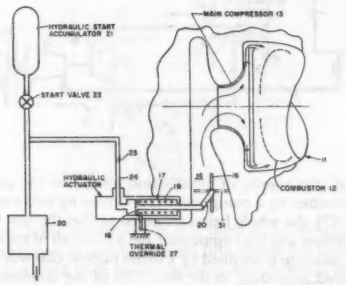
TURBINE ENGINE COLD TEMPERATURE STARTING SYSTEM

Walter R. Morgan, Simi Valley, Calif.; Edmund A. Boniface, Ogden, Utah, and Clayton A. Huben, West Bloomfield, Mich., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 28, 1978, Ser. No. 974,155

Int. Cl.³ F02C *7/26*

U.S. Cl. 60—39.141 **1 Claim**



1. In a gas turbine engine having a combustor including an ignitor thereof, a compressor with an air inlet and connected to said combustor for supplying a fuel/air mixture across the ignitor thereof, an improved main compressor intake system comprising:

rotatable damper means connected to said compressor at the air inlet thereof;

a hydraulic actuator having a piston linked to said rotatable damper means, said piston being resiliently biased to a normal operating position;

a hydraulic start accumulator disengagingly connected to said hydraulic actuator via a conduit, depletion of fluid pressure in said hydraulic start accumulator allowing said biasing means to return said rotatable damper means to the normal operating position after which said accumulator may be disengaged and pressure therein restored;

a hydraulically activated start motor and a start valve inserted in a fluid conduit connecting said hydraulic start accumulator and said motor;

a rate control orifice in said actuator conduit for controlling the rate of flow of liquid to said actuator and thereby the rate of travel of said piston; and

thermal override means housed in said hydraulic actuator for preventing actuation of said rotatable damper means under selected temperature conditions;

whereby said hydraulic actuator conduit is operatively connected to said fluid conduit at a point intermediate said start valve and said hydraulically activated start motor; upon actuation of said start valve, fluid accumulated in said hydraulic start accumulator actuates said hydraulically activeted start motor via said fluid conduit and actuates said hydraulic actuator via said actuator conduit.

4,509,326

ENERGY EXTRACTION FROM HOT GASES

Pierre Jörgensen, L'Hay les Roses, France, assignor to The British Petroleum Company p.l.c., London, England

Filed Aug. 2, 1982, Ser. No. 404,360

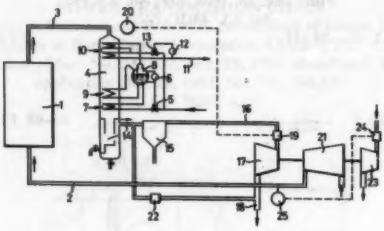
Claims priority, application France, Aug. 7, 1981, 81 15370

Int. Cl.³ F01K *23/00*

U.S. Cl. 60—39.182 **4 Claims**

1. Process for extracting energy and removing solid particles from hot, dust-laden gases (3) emitted from a plant (1) simultaneously supplied with combustion air (2) under pressure char-

acterized by the fact that (a) the hot gases (3) before being cooled or treated with water are supplied to a steam boiler (4) wherein thermal energy is extracted, (b) the solid particles are then removed in a dry manner from the cooled gases still under pressure, and (c) the solids-free and cooled gases are then fed to an expansion turbine (17) wherein mechanical energy is



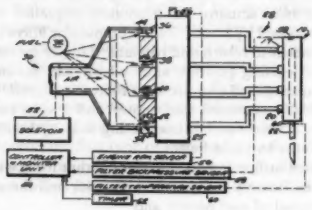
extracted, the supply of combustion air (2) to the plant (1) being provided by a compressor (21) driven by said expansion turbine (17), the whole being arranged so that the unit formed by the turbine and the compressor has a shortfall of energy and that the make-up is supplied by a steam turbine (23) whose inlet is regulated according to the flow (25) of the combustion air supplied.

4,509,327

REGENERATING CATALYTIC PARTICULATE FILTERS AND APPARATUS THEREFOR

Bernard E. Enga, West Chester, Pa., assignor to Johnson Matthey, Inc., West Chester, Pa.

Filed Jan. 27, 1983, Ser. No. 461,586
Int. Cl.³ F01N 3/02
U.S. Cl. 60—274 **23 Claims**



1. A method for regenerating a catalyzed particulate filter for an internal combustion engine having a plurality of cylinders comprising the steps of: during operation of the engine cyclically pulsating the intake air flow to a predetermined number of said plurality of cylinders so that the exhaust therefrom will generate an exotherm on the catalyst thereby igniting particulate material within the filter.

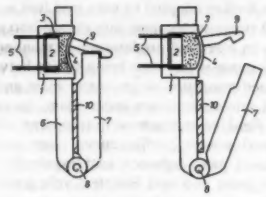
4,509,328

THERMO-ELECTRIC RESPONSIVE DEVICE

Walter Holzer, Drosteweg 19, S-7758 Meersburg, Fed. Rep. of Germany

Filed Jan. 15, 1982, Ser. No. 339,498
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3101473
Int. Cl.³ F03G 7/06
U.S. Cl. 60—528 **7 Claims**

1. An electro-thermal actuating component comprising:
a container;
an electrical heating element disposed in said container and having a positive thermal coefficient with a temperature/resistance curve having a sharp upward bend in a predetermined temperature range;
a deformable membrane disposed across said container to close same;
a liquid disposed in said container and immersing said heating element, said liquid having an evaporation temperature in the range of the bend in the temperature/resistance



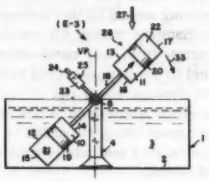
curve of said electrical heating element to vaporize in the predetermined temperature range of the electrical heating element to deform said membrane from a concave to a convex flexure;
a swiveling locking lever disposed proximate said membrane, upon deformation of said membrane from said concave to convex flexure said lever swiveling from a first to a second position.

4,509,329

GRAVITY-ACTUATED THERMAL ENGINES

Michael P. Breston, 102 Plantation, Houston, Tex. 77024

Filed Sep. 23, 1982, Ser. No. 421,972
Int. Cl.³ F03G 3/00, 7/06
U.S. Cl. 60—531 **21 Claims**



1. A power engine including in combination:
(a) elongate enclosure means comprising at least two separate fluid-tight enclosures having their respective longitudinal axes substantially aligned;
(b) a solid mass associated with each enclosure and movable in the longitudinal direction of said enclosures;
(c) abutment means for limiting the stroke of each solid mass;
(d) coupling means rigidly interconnecting said enclosures;
(e) pivot means defining an axis of rotation and pivotally supporting the engine for rotation from a first position, whereat a first enclosure is located at a first level above said axis of rotation, to a second position, whereat said first enclosure is located at a second level below said axis of rotation;
(f) a motive fluid enclosed within each enclosure, the pressure of said motive fluid varying in response to temperature changes;
(g) each solid mass being free to move only in response to a pressure change in its associated enclosure in the direction of the longitudinal axis thereof; and
(h) said engine being responsive to alternating thermal effects which cause alternating variations in the pressures of said enclosures resulting in alternating shifts of the center of gravity of said engine, thereby rotating said engine about said axis of rotation.

4,509,330

PNEUMATICALLY CONTROLLED PRESSURE TRANSDUCER FOR OPERATING HYDRAULIC WORK TOOLS

Béla Zimber, Budapest, and Imre Molnár, Székesfehérvár, both of Hungary, assignors to Kozponti Valto, Budapest, Hungary

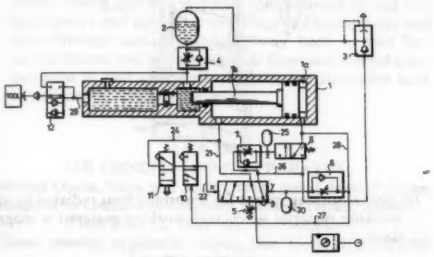
PCT No. PCT/HU82/00037, § 371 Date Apr. 4, 1983, § 102(e) Date Apr. 4, 1983, PCT Pub. No. WO83/00540, PCT Pub. Date Feb. 17, 1983

PCT Filed Aug. 4, 1982, Ser. No. 483,949

Claims priority, application Hungary, Aug. 4, 1981, 2257/81

Int. Cl.[3] F15B 7/08

U.S. Cl. 60—537 4 Claims



1. A pneumatically operated pressure transducer for the operation of a hydraulic work tool having a dual operating cylinder, on one side of which a pneumatically operable piston, on the other side a hydraulically operable piston is joined, comprising a control valve (9) coupled to a primary space located in front of the piston (1*a*) of the pneumatic cylinder of the dual operating cylinder, said control valve (9) being operatively coupled to a starter valve (11), the control valve (9) is coupled to a throttle-check valve (7) and said throttle-check valve (7) is coupled to a valve (8), said valve (8) connecting said control valve (9) to a quick exhaust waste valve (3) and to the hydraulic container (2) and with the secondary space of the pneumatic cylinder, a throttle-check valve (4) coupling said hydraulic container (2) to said hydraulic cylinder of the dual operating cylinder (1) in a fashion that said throttle-check valve (4) can be closed by the hydraulic piston (1*b*), and wherein a further throttle-check valve (6) is placed into a conduit (28) between the valve (8) and the cylinder (1) and couples said valve (8) and cylinder (1) into operating relationship with the control valve (9).

4,509,331

KNOCK-FREE ENGINE CONTROL SYSTEM FOR TURBOCHARGED AUTOMOTIVE ENGINE

Yuji Hirabayashi, Zushi, Japan, assignor to Nissan Motor Company, Limited, Yokohama, Japan

Filed Oct. 22, 1982, Ser. No. 436,029

Claims priority, application Japan, Oct. 27, 1981, 56-170756

Int. Cl.[3] F02B 37/12

U.S. Cl. 60—602 18 Claims

1. An engine control system for a turbocharged internal combustion engine for controlling spark ignition timing and charge pressure in an air induction passage, comprising:

first means for measuring engine speed and producing a first signal having a value representative of the engie speed;

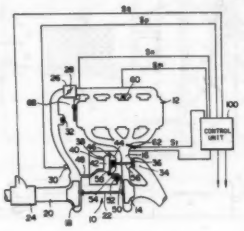
second means for measuring charge pressure in the air induction passage of the engine and producing a second signal having a value representative of the charge pressure;

third means for detecting an engine knocking condition and producing a third signal indicative of the engine knocking condition;

fourth means for controlling charge pressure relative to a given optimum pressure, said fourth means including an electrically-controlled valve for controlling said charge pressure;

fifth means for controlling a spark advance angle within a predetermined variation range defined by predetermined extremes for defining the spark ignition timing; and

sixth means for operating said fourth and fifth means in order to independently control charge pressure and spark ignition timing in accordance with the engine operating conditions represented by said first to third signals, said sixth



means being responsive to said third signal to selectively operate one of said fourth and fifth means for knock prevention, said sixth means defining said variation range of said spark advance angle and said optimum charge pressure value and operating said fourth means to adjust said charge pressure while holding said spark advance angle at an angle adjacent one of said extremes and said fifth means to adjust said spark advance angle while holding said charge pressure at said optimum charge pressure value.

4,509,332

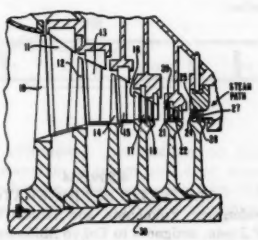
APPARATUS FOR MONITORING CORROSIVE SALT SOLUTIONS IN A LOW PRESSURE STEAM TURBINE

James C. Bellows, Maitland, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 30, 1984, Ser. No. 605,031

Int. Cl.[3] F01K 13/02

U.S. Cl. 60—660 12 Claims



1. Apparatus for monitoring corrosive salt solutions in a low pressure steam turbine having stages of rotating and stationary blades, said solutions occurring in a relatively narrow salt solution zone at one of the ultimate stages of said turbine, comprising:

(A) a first plurality of sensors affixed to a selected one of said stationary blades at a first location on said blade;

(B) at least a second plurality of sensors affixed to said selected stationary blade at a second location on said blade;

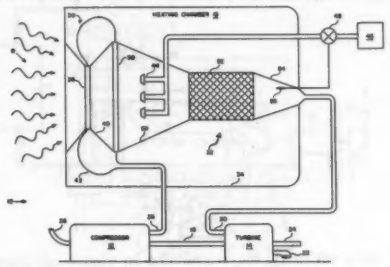
(C) each of said sensors of said first and second plurality being of the type which will provide an output signal indicative of the presence of a salt solution; and

(D) means responsive to all said sensor output signals to provide an indication of the location of said salt solution zone.

4,509,333
BRAYTON ENGINE BURNER

Theodore J. Nussdorfer, Nashua, and James B. Kesseli, Milford, both of N.H., assignors to Sanders Associates, Inc., Nashua, N.H.

Filed Apr. 15, 1983, Ser. No. 485,360
Int. Cl.³ F02C 7/00
U.S. Cl. 60—723 **4 Claims**



1. Apparatus for providing heated air to the inlet of a gas turbine having air inlet means for receiving air in a stream comprising:

(a) solar collection means situated in said air inlet means for receiving sunlight and imparting heat energy to the airstream,

(b) burner means situated in said air inlet means in series with said solar collection means for providing additional heat energy to the airstream, including

(i) fuel injection means for injecting fuel into the airstream,

(ii) catalyst means for reacting the fuel in the airstream with the air, and

(iii) sensing means for sensing a parameter related to the operation of the turbine and for adjusting the flow of fuel in response thereto,

(c) said solar collector means and said burner means disposed in a common housing forming a single heating chamber.

4,509,334
MAGNETIC REFRIGERATOR

Hideki Nakagome, Yokohama, and Satoshi Yasuda, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 23, 1983, Ser. No. 497,233
Claims priority, application Japan, Aug. 31, 1982, 57-150939
Int. Cl.³ F25B 9/00
U.S. Cl. 62—6 **17 Claims**

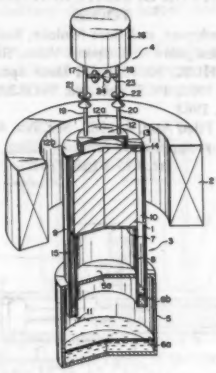
1. A magnetic refrigerator comprising:

(a) a container for the object to be cooled by the refrigerator;

(b) a working material which radiates heat when magnetized and absorbs heat when demagnetized;

(c) a magnetic field generating means for selectively applying a magnetic field to and removing a magnetic field from said working material;

(d) at least one heat pipe disposed between said working material and said container, said at least one heat pipe having an internal space therein through which heat is transferred from said container to said working material, said internal space being directly in contact with said working material; and

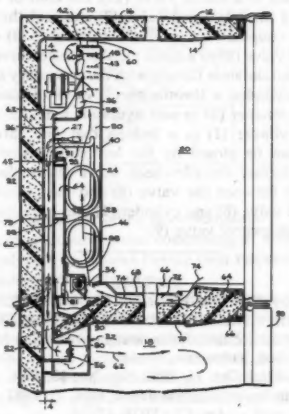


(e) heat absorbing means for absorbing heat radiated by said working material when said working material is magnetized.

4,509,335
PRE-ASSEMBLED COOLING AND AIR CIRCULATING MODULE FOR A HOUSEHOLD REFRIGERATOR

James R. Griffin, and James A. White, both of Louisville, Ky., assignors to General Electric Company, Louisville, Ky.

Filed Jun. 25, 1984, Ser. No. 624,201
Int. Cl.³ F25B 45/00
U.S. Cl. 62—77 **3 Claims**



1. A self-contained pre-assembled air circulating and cooling module adapted to be arranged in a refrigerator cabinet including guide means dimensioned for receiving a partition means dividing said refrigerator cabinet between a first food storage compartment to be maintained at a temperature above freezing and a second food storage compartment to be maintained at a below freezing temperature, the method of assembling and arranging said pre-assembled air circulating and cooling module in said cabinet comprising the steps of:

providing a main support frame dimensioned to extend substantially the full width of said cabinet in said second food storage compartment;

mounting a plate having an evaporator secured on one side

thereof in spaced relationship to said main support frame to define a first passageway therebetween;

positioning a cover portion on said support frame in spaced relationship to said plate defining a second passageway including said evaporator;

arranging air moving means in said module for moving air through said passageways;

inserting said module in said cabinet in spaced relationship to the rear wall of said cabinet so that a third passageway is arranged between said support frame and said cabinet wall; and

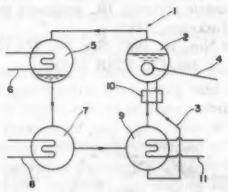
arranging said partition means in said cabinet guide means to thereby divide said cabinet between said first and second food storage compartments; whereby said air moving means directs air from said first compartment to said first passageway and thereafter to said second passageway and then through said third passageway back to said first compartment, and for directing air from said second compartment to said second passageway and thereafter back to said second compartment.

4,509,336

AIR CONDITIONING APPARATUS

Yasumasa Ouchi, Nara, and Shoji Otoshi, Sakai, both of Japan, assignors to Osaka Gas Company Limited, Osaka, Japan

Filed Dec. 12, 1983, Ser. No. 560,483
Claims priority, application Japan, Dec. 17, 1982, 57-222592
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—112 **2 Claims**



1. An air condition-heating apparatus including an absorption type heat pump which comprises:

an absorber containing an absorbent solution of an absorbent dissolved in a coolant,

a regenerator interconnected with said absorber for flow of said absorbent solution between said absorber and said regenerator and for vaporizing said coolant,

a condenser interconnected with said regenerator for receiving coolant vapors vaporized in said regenerator and for condensing said vapors,

an evaporator interconnected with said condenser for receiving and evaporating condensate from said condenser, and for directing coolant vapors from said evaporator to said absorber for absorption therein,

said absorbent solution including a mixture of lithium bromide and zinc chloride and said coolant is a solvent mixture of water and methanol, which has a ratio by weight of methanol to water in which the ratio ranges from about 0.1 to about 0.3 with the ratio measured on said absorbent solution in said evaporator.

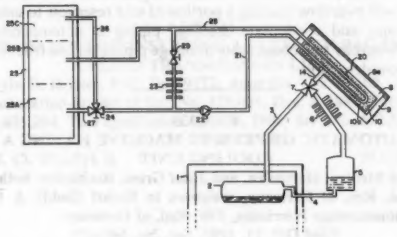
4,509,337

SOLAR ENERGY REFRIGERATION DEVICE

Albert Wiart, Sannois, and Gérard Paeye, Champagne sur Seine, both of France, assignors to Jeumont-Schneider Corporation, France

Filed Dec. 30, 1983, Ser. No. 567,268
Claims priority, application France, Jan. 3, 1983, 83 00001
Int. Cl.³ F25B *15/00*
U.S. Cl. 62—235.1 **7 Claims**

1. A refrigeration device comprising a solar collector containing a substance having a high adsorption and desorption capability, a condenser, an evaporator, a first channel including said condenser and said evaporator and having means for connecting said solar collector through said condenser to an input of said evaporator and, alternatively, for connecting said solar collector to an output of said evaporator, said first channel having a refrigeration fluid therein, and a separate second channel including a heat exchanger disposed in said substance, said second channel having means including a second fluid adapted to circulate through said heat exchanger for transferring heat between said substance and said second fluid.

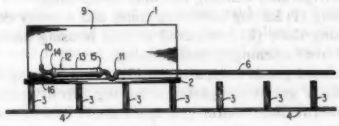


4,509,338

CONDENSATION ELIMINATION TANK

Eugene J. Gould, Village of Newhaven #613, Fripp Island, S.C. 29920

Filed May 7, 1984, Ser. No. 607,749
Int. Cl.³ F25D *21/14*
U.S. Cl. 62—288 **10 Claims**



1. A device for eliminating condensation, on condensate drainage piping located in a warm attic-type atmosphere, caused by cold condensate water emanating from the indoor section, including an air handler, of an air-conditioning system comprising:

a. a cylindrical external shell

b. a first end connection comprised of a reducing bushing connecting said cylindrical external shell's first end directly to said indoor section, including said air handler, of said air-conditioning system;

c. a second end connection comprised of a reducing busing connecting said cylindrical external shell's second end directly to said condensate drainage piping;

d. flow restricting means secured within said cylindrical external shell and operative to impede the flow of said cold condensate water, said flow restricting means comprising a drainage trough secured within said cylindrical external shell and rigidly connected to said first end connection and operative to impede the flow of said cold condensate water before said cold condensate water contacts said cylindrical external shell; and

e. a reservoir comprising cold condensate water which has

been heated by said warm attic-type atmosphere as said cold condensate water has been impeded by said flow restricting means to become warmed water, which has been deposited at the bottom of said cylindrical external shell where said warmed water has has been further heated by said warm attic-type atmosphere to become said reservoir, whereby when more of said cold condensate water emanates from said indoor section, including said air handler, of said air-conditioning system, said reservoir will overflow causing a portion of said reservoir to empty into said condensate drainage piping at a temperature whereby said condensate drainage piping will be free from condensation.

4,509,339

AUTOMATIC DISPENSING MACHINE HAVING A COOLING UNIT

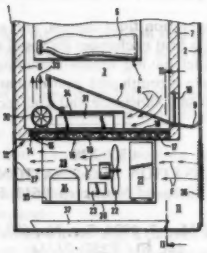
Bernd Mehlan, Herrieden, and Josef Gress, Bechhofen, both of Fed. Rep. of Germany, assignors to Sielaff GmbH & Co. Automatenbau Herrieden, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,671

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240124

Int. Cl.³ F25D *19/00*

U.S. Cl. 62—450 **10 Claims**



1. A refrigerated vending machine comprising:

a housing (**1**) having a front opening and a lower end;

a housing door (**2**) connected to said housing and closing said front opening of said housing;

an insulated goods compartment (**3**) in said housing (**1**), said insulated goods compartment having a front opening and an intermediate bottom (**12**) space above said lower end of said housing, said housing defining an equipment compartment (**11**) below said intermediate bottom, said intermediate bottom having a U-shaped opening (**13**) therein having a supporting shoulder (**14**), said U-shaped opening opening into said front opening of said insulated goods compartment;

a compartment door (**7**) connected to said goods compartment and closing said front opening of said goods compartment;

a shelving structure (**4**) mounted in said goods compartment above said intermediate bottom (**12**) for supporting goods to be vended;

an insulated mounting plate (**15**) in said U-shaped opening (**13**) and supported on said supporting shoulder (**14**), said insulated mounting plate being slidable forwardly out of said U-shaped opening with said housing door and said compartment door each in an open position for opening said front opening of said housing and said compartment; and

refrigeration means connected to said mounting plate for cooling said goods compartment, said refrigeration means being removable with said mounting plate from said housing through said front opening of said housing;

said refrigeration means comprising;

a vaporator (**31**) mounted on said mounting plate in said goods compartment and below said shelving structure;

an evaporator fan (**32**) mounted on said mounting plate in said goods compartment and below said shelving structure;

a condenser (**21**) mounted under said mounting plate and in said equipment compartment (**11**);

a condenser fan (**22**) mounted under said mounting plate in said equipment compartment; and

a compressor (**24**) mounted under said mounting plate and in said equipment compartment;

whereby said refrigeration means can be removed by moving said compartment door and said housing door into their open position for opening said front openings of said compartment and housing, and sliding said mounting plate (**15**) forwardly through said front openings without interferring with goods in said supporting structure (**4**).

4,509,340

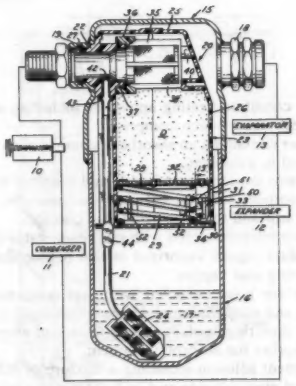
ACCUMULATOR-DEHYDRATOR ASSEMBLY FOR AN AIR CONDITIONING SYSTEM

Charles J. Mullally, Muskegon; Steven L. Brown, Spring Lake; David L. Anderson, Muskegon, all of Mich., and Robert F. Hitchcock, Glendale Heights, Ill., assignors to Sealed Power Corporation, Muskegon, Mich.

Filed Nov. 10, 1983, Ser. No. 551,101

Int. Cl.³ F25B *43/00*

U.S. Cl. 62—503 **62 Claims**



1. An accumulator-dehydrator assembly for an air conditioning system comprising

an accumulator housing defining an enclosed chamber including an inlet and an outlet in the upper end and a refrigerant and oil accumulator in the lower end,

a vapor drier canister assembly comprising a one-piece plastic body defining a closed top wall, a closed side wall and an open bottom,

said canister including an integral outlet projection extending into and sealingly engaging the outlet of said housing,

a vapor filter associated with said integral outlet projection of said canister such that refrigerant flows through the filter before passing through the outlet,

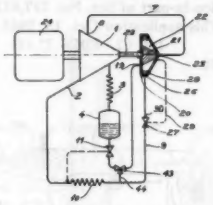
a perforated plate in the bottom of said canister for holding desiccant within said canister.

4,509,341

ECONOMIZER DEVICE FOR A REFRIGERATING MACHINE, A HEAT-PUMP OR THE LIKE

Bernard Zimmern, 6 New St., East Norwalk, Conn. 06855

Continuation-in-part of Ser. No. 491,475, May 4, 1983, abandoned. This application Jun. 11, 1984, Ser. No. 619,186
Claims priority, application France, May 13, 1982, 82 08325
Int. Cl.³ F25B *43/00*
U.S. Cl. 62—512 **23 Claims**



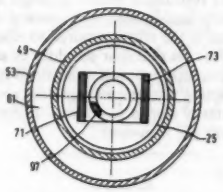
1. A refrigerator, heat-pump or like apparatus comprising a compressor provided with a casing having at least one intake port, at least one exhaust port, and at least one economizer port at a point where the pressure in the casing is, in operation, intermediate intake pressure and exhaust pressure; and a fluid circuit between the exhaust and the intake of the compressor, said circuit including a condenser, an evaporator, two valves between said condenser and said evaporator, a housing between said two valves, said housing having a central region and a peripheral region, a rotor mounted for rotation in said housing, a first gas conduit connecting said economizer port with said central region of said housing, substantially adjacent to the axis of rotation of said rotor, one of said two valves being an expansion valve and the second of said two valves having control means to maintain a liquid annulus which builds up in the peripheral region of the housing during operation of the apparatus with rotation of said rotor, and means for rotatably driving the rotor.

4,509,342

INFRARED RECEIVER HAVING A COOLED RADIATION DETECTOR

Hubrecht C. Van Antwerpen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 15, 1983, Ser. No. 561,856
Claims priority, application Netherlands, Oct. 19, 1983, 8303603
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **6 Claims**



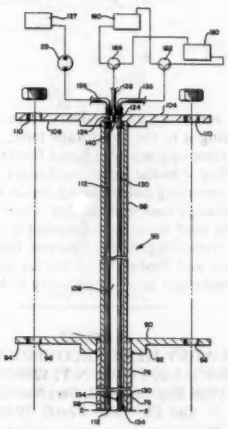
1. In an infrared receiver having a radiation detector in cold exchanging contact with a cooling surface of a cooler by way of a thermally conducting bridge between the cooling surface and the radiation detector, and wherein a support for the radiation detector is comprised of an inner wall of a thermal isolation vessel; the improvement wherein the bridge comprises an elastic metal cylinder of substantially rectangular cross-section, said cylinder being comprised of a plurality of turns of a metal strip secured in the proximity of each of diametrically opposite sides thereof, each side being secured between a mounting plate located inside the cylinder and a mounting plate located outside the cylinder, one of the mounting plates located outside the cylinder resiliently engaging the radiation detector, the other of the mounting plates outside the cylinder resiliently engaging the cooling surface.

4,509,343

APPARATUS FOR INSERTING A FLEXIBLE BAG INTO A FLUID TRANSMISSION LINE

Beryle D. Brister, P.O. Box 9272, Amarillo, Tex. 79105

Continuation-in-part of Ser. No. 328,029, Dec. 8, 1981, Pat. No. 4,428,204. This application Jan. 25, 1984, Ser. No. 573,554
Int. Cl.³ F25B *19/00*
U.S. Cl. 62—514 R **19 Claims**



1. Apparatus for inserting a flexible collapsible bag into a fluid transmission line and expanding said bag to form a flow stopping plug in said transmission line by filling said bag with a liquid and freezing said liquid in said bag, said apparatus comprising:

a frame for supporting said apparatus on said transmission line adjacent an opening in the wall of said transmission line;

a first member forming a casing for holding said bag in a collapsed condition;

a second member and means for connecting said bag to said second member, said second member being movable relative to said first member for injecting said bag into the interior of said transmission line;

means forming a passage for conducting liquid into the interior of said bag; and

means forming a heat exchanger extending into the interior of said bag when said bag is filled with liquid for transferring heat from said liquid to cool said liquid to form a frozen plug within said bag.

4,509,344

APPARATUS AND METHOD OF COOLING USING STORED ICE SLURRY

John S. Ludwigsen; Jill L. Ludwigsen, both of Naperville, and Terry A. Gallagher, Wheaton, all of Ill., assignors to Chicago Bridge & Iron Company, Oak Brook, Ill.

Filed Dec. 8, 1983, Ser. No. 559,486
Int. Cl.³ F25C *1/24*
U.S. Cl. 62—76 **36 Claims**

35. Apparatus comprising:

a freeze exchanger of the shell and tube type having an

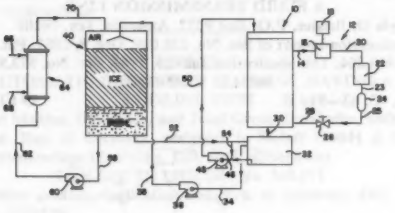
aqueous liquid feed stream inlet and an aqueous liquid stream outlet;

a closed loop refrigeration means for supplying a refrigerant to the shell side of the freeze exchanger;

a receiving tank for receiving a mixture of ice and aqueous liquid from the freeze exchanger outlet;

means for removing aqueous liquid from the receiving tank and feeding it to the freeze exchanger inlet;

an ice storage tank adapted to have a layer of ice floating on a layer of cold aqueous liquid in the bottom of the tank;



means for removing an ice slurry from the receiving tank and feeding it to the ice storage tank;

means for removing aqueous liquid from the ice storage tank and feeding it to the freeze exchanger inlet;

means for removing cold aqueous liquid from the bottom of the ice storage tank and feeding it to a heat exchanger to cool fluid used for air conditioning a building;

means for removing warm aqueous liquid from the heat exchanger and feeding it to the ice storage tank, or the freeze exchanger inlet, or partially to both.

4,509,345

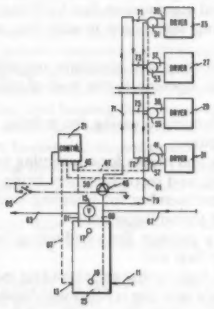
LAUNDRY HEAT RECOVERY SYSTEM

Peter Alio, Box 212-B, Tillson, N.Y. 12486

Filed Sep. 30, 1982, Ser. No. 429,627

Int. Cl.³ D06F *31/00, 39/04*

U.S. Cl. 68—20 **10 Claims**



1. A laundry heat recovery system comprising in combination,

a laundry installation comprising a wash water source and a plurality of laundry washers and dryers,

a plurality of heat exchangers,

each of said heat exchangers being mounted in the exhaust outlet of an associated dryer,

each of said heat exchangers being adapted to heat the water contained therein with exhaust heat from its associated dryer,

a heat sensor associated with each of said heat exchangers for determining the temperature of the water therein,

a heat sensor associated with said wash water source, and

means responsive to a predetermined relationship between said heat exchanger sensors and said wash water source sensor for selectively circulating the water through said heat exchangers to said wash water source, thereby raising the temperature of said wash water source.

4,509,346

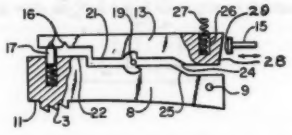
HANDCUFF LOCK CONSTRUCTION

Thaddeus J. Szczepanek, Springfield, Mass., assignor to Universal Tool Company, Inc., Springfield, Mass.

Continuation-in-part of Ser. No. 327,812, Dec. 7, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 541,674

Int. Cl.³ E05B *75/00*

U.S. Cl. 70—16 **3 Claims**



1. In a double-locking shackle device having (1) a casing, (2) a fixed arm, one end of which is held by said casing, (3) a movable arcuate locking arm, one end of which is pivotally mounted to the other end of said fixed arm and which has a first series of inclined teeth at its free end, said locking arm being adapted to have said free end move circularly through one side of said casing, (4) an elongated latch pivotally mounted by one end within said casing, the free end of which latch has a second series of inclined teeth adapted to engage said first series, (5) an elongated bolt within said casing and adjacent and behind said elongated latch, (6) restraining means between said latch and bolt normally resiliently urging said latch and said second series of inclined teeth against said first series and permitting closure of said locking arm but not opening thereof, said bolt being slideable within limits along the axis of its length from a locking position of engagement with said latch preventing movement thereof and disengagement of said first and second series of inclined teeth to an unlocked, retracted position allowing movement of said latch and closure of said locking arm, and (7) a drift pin in said casing at the end of said bolt and effecting movement of said bolt into said locking position by said drift pin being pushed from outside said casing against said end; the improvement restraining the unwanted sliding movement of said bolt comprising a first shoulder on said latch near the pivot point thereof and facing said bolt, a second shoulder on said bolt adapted to slideably engage said first shoulder and as the two shoulders engage to effect a widening between the longitudinal axes of said latch and bolt; a second restraining means between said casing and said bolt resiliently urging said bolt toward said latch and causing an increase in the effort required to effect riding up of said second shoulder on said first shoulder as said bolt moves towards said locking position; and an inclined face on said end of said bolt contacting the nose of said drift pin and said nose being complimentarily sloped to effect a lifting action on said end when said drift pin is pushed.

4,509,347

DOOR LOCKING SYSTEM

Quentin H. Young, San Antonio, Tex., assignor to Southern Steel Company, San Antonio, Tex.

Filed Jun. 30, 1982, Ser. No. 393,701

Int. Cl.³ E05B *47/00, 65/06;* **E05C** *1/06, 1/12*

U.S. Cl. 70—129 **29 Claims**

1. An electrically operated door locking system comprising:

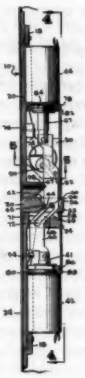
a door mounted in a door jamb separating a room from a corridor or the like;

a modular carrier frame mounted in said door jamb;

bolt means mounted on said carrier frame for reciprocation between a retracted position wholly enclosed within said housing an an extended position in which one end of said bolt means protrudes from said housing;

a bolt actuator cam slide operable for movement between a lock position and an unlock position for respectively positioning said bolt means in said extended position or said retracted position;

guide surfaces on said carrier frame for precluding horizontal movement of the bolt actuator cam slide;



solenoid means for selectively positioning said bolt actuator slide in its unlock or lock positions;

a control circuit for said solenoid means including circuit means for actuating said solenoid means to cause the bolt actuator slide to move to its lock position in response to movement of the door to closed position; and

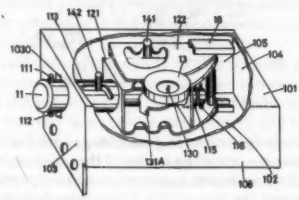
means operable in response to said door not being in a fully closed position for preventing actuation of said solenoid means so as to preclude movement of the bolt to its lock position.

4,509,348

DEVICE FOR AUTOMATIC LOCK

S. P. Hsu, No. 8, Lane 232, Line-sen Rd., Hu-wei, Yunlin Hsien, Taiwan

Filed Sep. 20, 1982, Ser. No. 420,118
Int. Cl.³ E05B *63/12*
U.S. Cl. 70—131 **2 Claims**



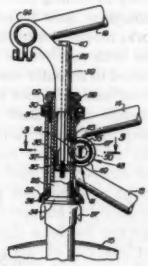
1. A lock comprising a housing having disposed therein an activating mechanism comprising a movable bracket and a multistage locating plate straddling said movable bracket, said locating plate and movable bracket being hingedly connected at one end by means of a pin, a spring means being used to urge said movable bracket toward from said multistage locating plate, said pin being placed between guide tracks provided on the interior walls of said housing to allow lateral movement of said activating mechanism, a laterally movable lug being disposed within said movable bracket so that in a retracted position said lug is disposed within said housing and in an extended position, said lug extends out of said housing to enter a socket disposed adjacent said housing, said lug being provided with a bent slot through which a fixing rod extends so that when said lug is in its fully extended position, said fixing rod causes said lug to rotate, said movable bracket and said multistage locating plate being provided with notches to engage a cam plug activatable by a key to permit selected lateral movement of said activating mechanism when the key is turned.

4,509,349

BICYCLE WITH KEY-OPERATED LOCKING MECHANISM

Wilfred H. Partridge, 1477 Royal Blvd., Glendale, Calif. 91207

Filed Feb. 15, 1983, Ser. No. 448,025
Int. Cl.³ E05B *71/00*
U.S. Cl. 70—233 **5 Claims**



1. In combination with a bicycle having a frame including an upright head tube having an opening in its rear side and two struts arranged in a "V" with the head tube at the vertex, a handlebar having a depending stem projecting downwardly into the head tube, a front wheel fork having an upstanding fork stem projecting upwardly into the head tube and telescoping with the handlebar stem, and means for rotatably mounting the telescoped stems in the head tube for steering of the bicycle, an improved locking mechanism fitted into the "V" between the struts and against the head tube, comprising:

a cylinder lock extending transversely across said rear side and having a lock cylinder with a key slot at one end, a body rotatably supporting said lock cylinder and having an annular groove around the body, a removable key for turning said cylinder in said body between locking and unlocking positions, and a locking bolt mounted on said lock cylinder and extending radially therefrom into said groove to swing along the groove as the lock cylinder is turned by said key;

said body having an arcuate recess in its front side in which said stems are nested, and said bolt projecting forwardly into said recess and into said head tube when said cylinder is in said locking position, and being retracted from said recess when the cylinder is in the unlocking position;

means defining first and second angularly spaced, longitudinally extending locking slots in at least the outer one of said telescoping stems alongside said cylinder lock, to be aligned with said bolt in two selected angular positions of said handlebar and said front wheel fork, said locking slots being sized to receive said bolt with a relatively close locking fit and to prevent steering of the bicycle;

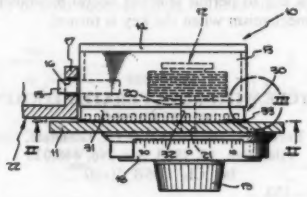
and a part-cylindrical protective lock housing fitted over said lock cylinder and having an opening exposing said one end, said lock housing being secured to said frame to hold and protect said cylinder lock.

4,509,350

PROTECTIVE LOCK MOUNTING PLATE FOR SAFE DOOR LOCKS

Klaus W. Gartner, 2632 Via Anacapa, Palos Verdes Estates, Calif. 90274

Filed Jun. 27, 1983, Ser. No. 508,119
Int. Cl.³ E05B *15/16*
U.S. Cl. 70—333 R 3 Claims



1. A protective lock mounting plate for mounting a lock to the interior of a safe door, said lock having a lock housing containing lock works mounted interiorally of the safe door, a dial shaft associated with said works for operating the same and a lock dial mounted to an outer end of the dial shaft exteriorally of the safe door, said safe door having a shaft receiving bore to facilitate passage of said shaft therethrough, said protective lock mounting plate comprising:

a plate-like body of hardened material having a body throughbore to receive said dial shaft of said safe door lock therethrough wherein said plate-like body is provided with a plurality of concentric circular grooves and a material of greater hardness than the plate-like body is positioned in at least one of said grooves;

means for mounting said body to the inner surface of said safe door with said body throughbore aligned to said shaft receiving bore of said door; and

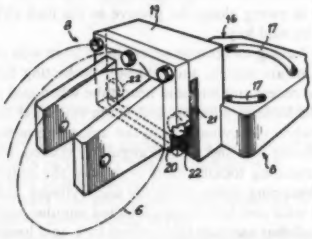
means for mounting said lock housing to said body with said dial shaft extending through said body throughbore and door bore whereby said lock works are protected against intrusion as by drilling through said door.

4,509,351

SPINNING LATHE

Guy Rolin, Chelles, France, and Jacques Rabizzoni, late of Lesigny, France (by Yannick Rabizzoni neé Volle, administratrix), assignors to Etablissements Rondolotti, Vincennes, France

Filed Jan. 26, 1982, Ser. No. 342,805
Claims priority, application France, Jan. 26, 1981, 81 01383
Int. Cl.³ B21B *37/08*; B21D *22/16*
U.S. Cl. 72—19 9 Claims



1. A spinning/fluoturning machine, comprising:

a bed;

a chuck;

a device mounted on said bed for rotating said chuck about a horizontal axis;

said chuck carrying a form having a contour corresponding to that of a workpiece which is to be produced;

a carriage mounted relative to said bed to be movable in two directions which are mutually perpendicular;

a support means for a spinning tool, comprising:

a post rigid with said carriage, and

a yoke member rotatably mounting said spinning tool;

a first part of said yoke member being fixed to said post in a thrust-transmitting abuttment relationship while allowing, in use, slight deformation of a second part of said yoke member by virtue of stresses imparted thereto by said spinning tool in the course of conducting a spinning/fluoturning operation;

sensor means fixed to said post so as to be responsive to said deformation of said second part of said yoke member;

means for shifting said carriage, comprising a shifting device connected to said carriage and including a control element for shifting said carriage by means of said shifting device in a respective one of said two directions which is substantially transverse to a mean generatrix of said chuck;

a servo-loop connected to said control element of said shifting device, comprising, as a generator of a real instantaneous signal, said sensor means; and

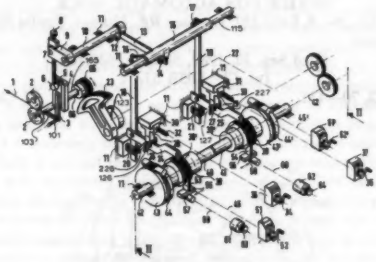
a generator of a set value representing the force required to be exerted by said spinning tool on said workpiece, comprising means for dynamically varying said set value within the course of each working travel of said spinning tool, said sensor means and said set value generator being connected to comparing means for comparing the set value provided by said set value generator and the real instantaneous signal provided by said sensor means and for delivering a signal to said control element of said shifting device.

4,509,352

SPRING COILING MACHINE

Max Frei, Schönenwerd, Switzerland, assignor to Schenker Maschinen AG, Schönenwerd, Switzerland

Filed May 13, 1983, Ser. No. 494,183
Claims priority, application Switzerland, May 24, 1982, 3176/82; Sep. 20, 1982, 5531/82
Int. Cl.³ B21F *3/02*
U.S. Cl. 72—138 24 Claims



1. A machine for converting wire into a series of coil springs during successive operating cycles of the machine, comprising a support; feeding means mounted in said support and operative to advance the wire along a predetermined path; a wire treating tool mounted on said support for movement with reference to said path; means for moving said tool, including first and second rotary cams and means for transmitting motion from said cams to said tool, said motion transmitting means including first and second follower means arranged to track the respective cams during first and second stages of each cycle so that the first cam determines the position of said tool during the making of a first portion and the second cam determines the position of said tool during the making of the remainder of each spring; and adjusting means for changing the posi-

tion of at least one of said cams with reference to the other of said cams, irrespective of whether the machine is in operation or at a standstill, to thereby change the timing of transmission of motion from the one cam to said tool during successive cycle.

4,509,353

METHOD OF AND APPARATUS FOR FORMING GEARS

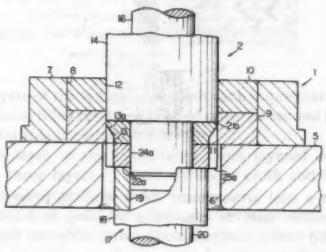
Masahide Ike, Yokosuka, and Masashi Arita, Yokohama, both of Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Filed Feb. 18, 1983, Ser. No. 467,603

Claims priority, application Japan, Mar. 23, 1982, 57-46108; Sep. 24, 1982, 57-167111

Int. Cl.³ B21C *23/18*

U.S. Cl. 72—267 **4 Claims**



1. A method of forming gears from annular blanks each having flat opposite end faces and predetermined inside and outside diameters in a gear-forming apparatus including a die block formed with an axial bore having a diameter slightly larger than the outside diameter of the blanks and a plurality of teeth radially projecting into the bore, a hollow cylindrical punch sleeve having a flat end face and a predetermined inside diameter slightly smaller than the inside diameter of the blanks and a predetermined outside diameter substantially equal to the diameter of the bore in the die block, an elongated mandrel having a diameter substantially equal to the inside diameter of the punch sleeve, and a cylindrical backup sleeve having a flat end face and a predetermined outside diameter smaller than the diameter of the deddendum circle of said teeth, the punch sleeve and the backup sleeve being axially movable with respect to each other and to said die block, comprising:

preliminarily forcing at least one of the blanks into the bore in the die block until the blank is partially deformed by said teeth;

placing another one of the blanks on the preceding blank so that the subsequent blank has one of its end faces received on one end face of the preceding blank;

causing said mandrel to axially extend through the respective center holes in the preceding and subsequent blanks;

pressing the preceding and subsequent blanks between the respective end faces of said punch sleeve and said backup sleeve and forcing the two blanks through the bore in the die block so that the preceding blank is caused to form gear teeth on its outer peripheral surface by the teeth of the die block; and

forcing the subsequent blank and the gear resulting from the preceding blank through the bore in the die block for withdrawing the gear out of the bore in the die block,

wherein each of the blanks in the axial bore in the die block is axially pressed upon in one direction by means of said punch sleeve and in the opposite direction by means of said backup sleeve and is forced to move in the former direction through the axial bore in the die block.

4,509,354

METHOD OF MANUFACTURING FAN GUARD

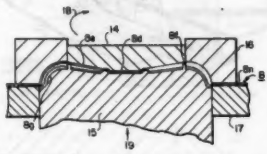
Akio Suzuki; Mitsuo Akiyama; Hideo Uzuhashi; Izumi Ochiai, all of Tochigi; Hitoshi Yamashita, Ashikaga; Youji Sekine, Tochigi; Katsuo Matsui, Utsunomiya, and Syuji Tomita, Tochigi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 29, 1982, Ser. No. 403,017

Claims priority, application Japan, Apr. 22, 1981, 56-59884

Int. Cl.³ B21D *53/00, 53/80*

U.S. Cl. 72—294 **4 Claims**



1. A method of manufacturing a fan guard from a plate member, comprising the steps of:

forming a plurality of radially inward slits each having at least a radial slit section in a first section of said plate member, said first section extending between a central section of said plate member and a ring-like section thereof radially outwardly spaced from said central section, said radial slit sections radially extending in said first section from said central section to said ring-like section in circumferentially spaced relation to each other;

forming a plurality of radially outward slits each having at least an arcuate slit section in a second section of said plate member, said second section extending between said ring-like section and an outer peripheral section of said plate member radially outwardly spaced from said ring-like section, said arcuate slit sections extending from said ring-like section to said outer peripheral section in circumferentially spaced relation to each other;

bending portions of said first section each extending between the adjacent two radial slit sections to form louvers; and

offsetting said central section, said first section and said ring-like section from said outer peripheral section while rotating said central section, said first section and said ring-like section relative to said outer peripheral section, to twist portions of said second section each extending between the adjacent two arcuate slit sections to form louvers.

4,509,355

APPARATUS FOR FORMING A SHEET METAL PRODUCT HAVING AN OPENING

Masatoshi Oishi, Hiroshima, Japan, assignor to Mazda Motor Company, Hiroshima, Japan

Filed Sep. 27, 1982, Ser. No. 424,313

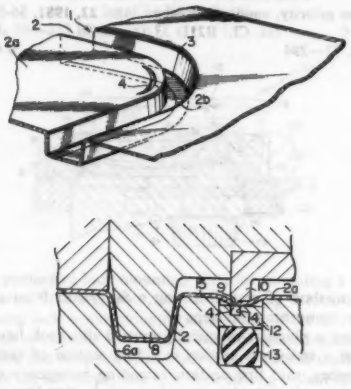
Claims priority, application Japan, Sep. 29, 1981, 56-155482

Int. Cl.³ B21D *28/00, 28/32*

U.S. Cl. 72—325 **3 Claims**

1. An apparatus for manufacturing from a blank of sheet metal a sheet metal product including an area which is to be cut off in a later stage to form an opening which has at least one corner portion surrounded by a drawn area, said apparatus comprising: a pair of cooperating complementary dies, one die having drawing punch means and the other die having drawing cavity means for drawing a blank of sheet metal, said punch being movable along an axis towards said cavity, said punch and cavity having a noncylindrical shape taken in cross-section transverse to said axis so that the shape of each punch and cavity is defined by a working surface comprising side surfaces extending along said axis with each of said side surfaces being connected at a corner, one of said dies being provided in said area which is to be cut off and adjacent to said corner portion

with tearing projection means located only at said corners of the side surfaces and projecting toward the other die, at a portion in which material of the blank is stretched while it is being drawn, the other die being provided with receptacle



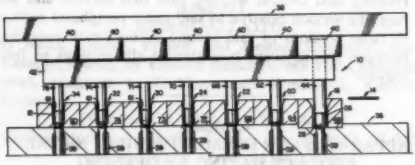
means supported by said other die through resilient support means and having recess means for loosely receiving said tearing projection means so that the blank is torn by said tearing projection means when it is being drawn.

4,509,356

METHOD AND APPARATUS FOR DRAWING HEAVY WALL SHELLS

John D. Budrean, DeMotte, Ind., and John A. Kirkpatrick, Chicago Heights, Ill., assignors to Verson Allsteel Press Co., Chicago, Ill.

Filed Aug. 13, 1982, Ser. No. 408,015
Int. Cl.³ B21D *22/00*
U.S. Cl. 72—349 **9 Claims**



1. An apparatus for forming a material into a part having side walls, comprising:

a first draw stage of forming having a draw die and cooperating draw punch to draw the material through said draw die to form the material, said draw punch having a nose portion of relatively reduced diameter and a relatively enlarged diameter portion to form a draw shoulder between the nose portion and relatively enlarged diameter portion for forming a step in the side walls of the part to establish the volume of material below said shoulder, said draw shoulder sharply defined to prevent metal from flowing upward past said draw shoulder; and

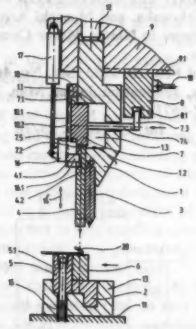
a finishing stage of forming to form the bottom portion of the part, said finishing stage having a finishing die and cooperating finishing punch to form the material, the finishing punch having a finishing shoulder for contacting the step formed in the side walls of the part to maintain the volume of material below said finishing shoulder equal to said first draw stage.

4,509,357

TOOL ARRANGEMENT FOR A BENDING PRESS

Vaclav Zbornik, Oftringen, Switzerland, assignor to Hämmerle AG Maschinenfabrik, Zofingen, Switzerland

Filed May 23, 1983, Ser. No. 497,144
Claims priority, application Switzerland, Jun. 7, 1982, 3496/82
Int. Cl.³ B21D *17/02*
U.S. Cl. 72—384 **13 Claims**



1. In a tool arrangement for a bending press including a displaceable ram, an elastically yielding hydraulic cushion provided within said ram and a work table, the improvement which comprises:

a segmental tool holding fixture operatively connected with said hydraulic cushion;

a segmental first tool arranged in said segmental tool holding fixture and displaceable in a first displacement plane;

a two-piece auxiliary second tool arranged in said tool holding fixture in addition to said segmental first tool;

said auxiliary second tool being subdivided into substantially horizontally displaceable spacer segments each having a contact surface and related tool segments substantially vertically displaceable in a second displacement plane;

said auxiliary second tool being displaceable into an operative position in which said spacer segments and said tool segments are arranged in substantially superimposed relationship with the contact surface on each spacer segment being in contact with its related tool segments and into an inoperative position in which said spacer segments and said tool segments are arranged in juxtaposition with said contact surfaces in noncontact relationship with said tool segments;

said horizontally displaceable spacer segments being structured for displacement substantially perpendicular to said second displacement plane of said vertically displaceable tool segments and said vertically displaceable tool segments being structured for displacement substantially parallel to said first displacement plane;

a tool support secured to said work table and provided with a bottom die; and

said segmental first tool cooperating with said bottom die.

4,509,358

URETHANE DIES

William G. Krowl, Roseville, Mich., assignor to Chrysler Corporation, Highland Park, Mich.

Filed Mar. 26, 1984, Ser. No. 593,449
Int. Cl.³ B21C *3/02*; B29C *1/00, 27/00*
U.S. Cl. 72—476 **8 Claims**

1. A laminated forming tool with a work contact surface, tool sides and a base made from resins and fillers for the cold forming of sheet metal, especially suitable for forming short

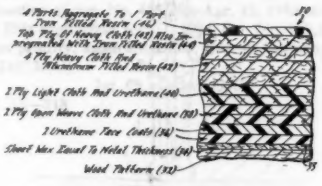
runs of sheet metal parts with drop hammers, hydraulic presses or mechanical crank presses and the like which comprises:

two layers of urethane on the tool sides and adjacent the contact surface;

two layers of loose-knit cloth each impregnated into two more urethane layers;

a first layer of thin, tight-knit cloth impregnated into another urethane layer;

a second layer of thin, tight-knit cloth impregnated with aluminum filled resin and layered onto the first layer of thin, tight-knit cloth;



three layers of thick, tight-knit cloth each impregnated with aluminum filled resin and layered onto the second layer of thin, tight-knit cloth;

a fourth layer of thick, tight-knit cloth layered onto the other three layers of thick tight-knit cloth and impregnated with iron filled resin;

a mass cast core comprising four parts aggregate mixed with one part iron filled resin formed onto the fourth layer of thick, tight-knit cloth, the core having a surface at the cloth and a free surface;

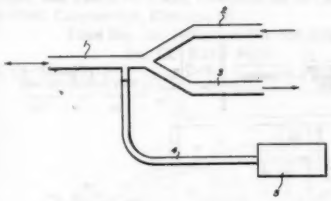
a base affixed to a free surface of said core available for mounting purposes on a machine to press or form the sheet metal parts.

4,509,359

METHOD AND APPARATUS FOR MEASURING THE CONCENTRATION OF A GIVEN COMPONENT IN A GAS INHALED AND/OR EXHALED BY A PATIENT

Andras Gedeon, Täby, and Lennart Mathiasson, Lund, both of Sweden, assignors to Gambro Engström AB, Bromma, Sweden

Filed Dec. 10, 1982, Ser. No. 448,802
Claims priority, application Sweden, Dec. 23, 1981, 8107775
Int. Cl.³ G01N *31/00*
U.S. Cl. 73—23 **6 Claims**



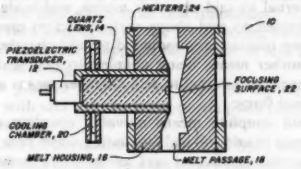
1. A method for measuring the concentration of at least one given component in a breathing gas passing through a breathing-gas line connected to the air passages of a patient, comprising the steps of withdrawing continuously a small part of the gas flow passing through said breathing-gas line, bringing the relative humidity and temperature of said withdrawn gas into substantial agreement with the relative humidity and temperature of the ambient air, and subsequently supplying said withdrawn gas to a measuring instrument sensitive to the concentration of said component.

4,509,360

ON-LINE MEASUREMENT OF FLUID MIXTURES

Lewis Erwin, Winchester, Mass., and Jeffrey L. Dohner, Fort Wayne, Ind., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Jun. 24, 1983, Ser. No. 508,217
Int. Cl.³ G01N *29/00*
U.S. Cl. 73—61 R **23 Claims**



1. An apparatus for determining the degree of mixing of components in a fluid mixture, the apparatus comprising:

(a) a housing having a passageway through which the fluid mixture to be analyzed passes;

(b) a source of wave energy;

(c) a focusing surface coupled to the source of wave energy transmitting the wave energy into the fluid mixture and focusing the wave energy in the passageway in an interrogation zone within the passageway such that changes in the impedance of the fluid mixture caused by unmixed components within the zone will cause fluctuations in the intensity of backscattered wave energy; and

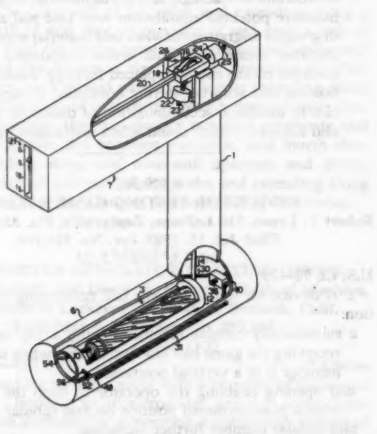
(d) a detector means also coupled to the fluid mixture within the passageway for detecting a portion of the focused wave energy back scattered by the components and thereby determining the dispersion of components in the fluid mixture by measuring fluctuations in the intensity of the backscattered portion of the wave energy.

4,509,361

SOIL MOISTURE POTENTIAL DETERMINATION BY WEIGHT MEASUREMENT

Lonnie G. Johnson, 12503 S. 31st St., Omaha, Nebr. 68123

Filed Nov. 30, 1983, Ser. No. 556,276
Int. Cl.³ G01N *5/02*
U.S. Cl. 73—73 **12 Claims**



1. An instrument for measuring soil moisture potential, said instrument being positioned in contact with the soil being measured and comprising:

a. A structure means joined to an absorber means by a coupling means and a scale means, said structure means providing containment and physical mounting means for said absorber means, said coupling means and said scale means, said structure means including a subsurface chamber means, a baffle means and an above surface section chamber means, said chamber means being installed in direct contact with said soil, said absorber means being mounted internal to said chamber means, said scale means being mounted to said above surface section means, said coupling means being mounted to said chamber means, said absorber means being coupled to said scale means and suspended internal to said chamber means under gravitational force;

b. Said coupling means movably coupling said absorber means to said soil and facilitating water flow between said absorber means and said soil to effect moisture potential equilibrium of said absorber means with said soil, said absorber means absorbing water and maintaining moisture potential equilibrium with said soil, said scale means weighing said absorber means to determine moisture content thereof and provide an indication of soil moisture potential, said coupling means offering minimum resistance to movement of said absorber means to permit accurate weight measurements thereof;

c. Said scale means including an indicator means, a bias calibration means and a gain calibration means, said indicator means being an integral part of said scale means and providing a visible indication of soil moisture potential, said bias calibration means being coupled to said indicator means and being adjustable for selecting an operating range for said instrument, said gain calibration means being coupled to said indicator means and being adjustable for selecting ratios of change in soil moisture potential indication to change in weight of said absorber and thereby cause said indicator means to display desired units of soil moisture potential;

d. Said subsurface chamber means being constructed of porus material means, said baffle means and said porus material means functioning to minimize affects on instrument accuracy due to water vapor migration induced by environmental temperature transients, said baffle means being mounted internal to said structure means and isolating said chamber means to prevent water vapor migration between said absorber means and said above ground section means to minimize affects of water vapor migration on instrument readings, said porus material means being in moisture potential equilibrium with said soil and permitting vapor migration between said material means and said absorber means such that water evaporated from said absorber means can be replaced through water condensation on said absorber during continued termperature cycles to minimize accummulation of dissolved minerals in said absorber which could affect instrument calibration.

4,509,362

DEVICE FOR TESTING GAME BALLS

Robert V. Lyons, 516 LaForce, Zephyrhills, Fla. 33599

Filed Jul. 15, 1983, Ser. No. 514,106
Int. Cl.³ G01N *3/52*
U.S. Cl. 73—79 **13 Claims**

1. A device for testing a game ball comprising in combination:

a substantially tubular member having a top opening for receiving the game ball inserted therein when said tubular member is in a vertical position;

said opening enabling the operator to drop the game ball from a predetermined position on said tubular member;

said tubular member further including;

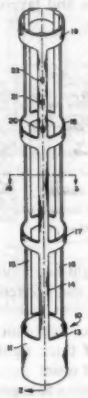
a plurality of vertically spaced cylindrical bands;

at least three vertically extending guides interconnecting said bands;

said guides being equidistantly spaced about said cylindrical bands;

a striking surface secured to said tubular member in proximity to a bottom portion of said tubular member when said tubular member is in the vertical position;

calibrated markings disposed along the length of said tubular member for indicating the degree of resiliency of the game ball in accordance with the rebound of the same from said



striking surface, said calibrated markings comprising markings to indicate a dead ball, old ball and live ball, respectively; and

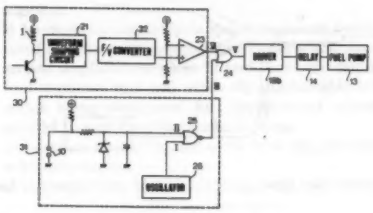
each of said guides projecting inwardly of said tubular member along the longitudinal length thereof for guiding the game ball to be tested from said opening toward said striking surface and for guiding the game ball during the rebound from said striking surface.

4,509,363

SYSTEM FOR DIAGNOSING A DEVICE OF AN INTERNAL COMBUSTION ENGINE

Toshio Takahashi, Mitakashi, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1983, Ser. No. 536,038
Claims priority, application Japan, Oct. 1, 1983, 57-173624
Int. Cl.³ G01M *15/00*
U.S. Cl. 73—118 **4 Claims**



1. A system for diagnosing a device of an internal combustion engine mounted on a vehicle comprising; first means for detecting an engine operating condition and for producing an output; second means for converting said output to a control signal; a driver responsive to said control signal for driving said device; a first gate means for controlling said control signal from said second means to said driver; a force-driving system for forcibly driving said device; said force-driving system comprising a manual operated terminal for applying a

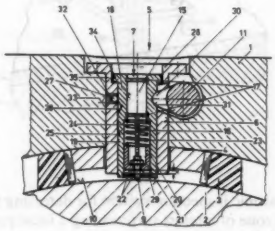
voltage; an oscillator for producing pulses; a second gate means responsive to said voltage from said terminal for controlling said pulses, said first gate means being applied with said pulses and operative to pass the pulses in response to the level of said control signal, whereby said device is driven by said pulses.

4,509,364

WEAR MEASURING ARRANGEMENT FOR BEARINGS

Karl H. Schütz, Schweinfurt, Fed. Rep. of Germany, and Günter Mauch, Vienna, Austria, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Continuation of Ser. No. 485,284, Apr. 15, 1983, abandoned.
This application Aug. 7, 1984, Ser. No. 638,537
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 8210726[U]
Int. Cl.³ G01M *13/04*
U.S. Cl. 73—118 **11 Claims**



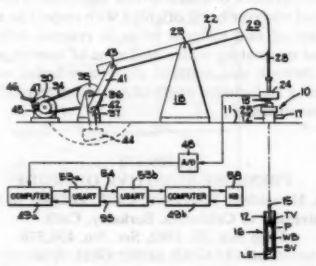
1. A wear measuring apparatus for measuring wear on a sliding surface of a first bearing part, comprising a support sleeve slidably arranged in a second bearing part for movement between upper and lower positions, away from and toward said sliding surface, a. d a sensor assembly, said sensor assembly including a sensor, a plunger-type armature, a probe tip connected to said armature, and a spring, said spring being mounted with respect to said support sleeve and said plunger-type armature so as to urge said plunger-type armature in the direction of said sliding surface.

4,509,365

METHOD AND APPARATUS FOR WEIGHING A SUCKER-ROD PUMPED WELL

Donald E. Eineichner, San Jose; Rangasami S. Chandra, Walnut Creek, and James M. Tucci, Campbell, all of Calif., assignors to FMC Corporation, Chicago, Ill.

Filed Sep. 26, 1983, Ser. No. 535,490
Int. Cl.³ E21B *47/00*
U.S. Cl. 73—151 **17 Claims**



15. A method of detecting and analyzing faults in downhole equipment of a sucker-rod pumped well by weighing the well and providing a digital display of the weight values, said well having a downhole pump which includes a standing valve and a plunger with a traveling valve, said equipment including a sucker-rod string connected to said plunger and a load measuring transducer connected between a power unit and an upper portion of said sucker-rod, said power unit reciprocating said plunger to produce fluid from an underground location, said method comprising the steps of:

supporting said rod string independent of said transducer to obtain a zero load signal from said transducer;

storing said zero load signal for use in correcting load signals when said transducer supports the weight of said plunger and said rod string;

halting said plunger at a position adjacent the top of an upstroke with said transducer supporting said plunger and said rod string;

taking a series of corrected load readings from said transducer with said plunger in a stationary position; and

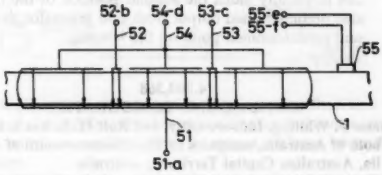
using said series of corrected load readings to check for faults in said traveling valve and its associated equipment.

4,509,366

FLOW METER FOR A TWO-PHASE FLUID

Shigetada Matsushita, Tokyo, and Yuji Doi, Oita, both of Japan, assignors to Fuji Electric Co., Ltd., Kanagawa and Nippon Steel Corporation, Tokyo, both of, Japan

Filed Apr. 28, 1983, Ser. No. 489,294
Claims priority, application Japan, Apr. 30, 1982, 57-73170
Int. Cl.³ G01F *1/74, 1/86*
U.S. Cl. 73—861.02 **7 Claims**



1. In a flow meter for measuring the mass flow of a two-phase fluid flowing through a pipe arrangement using an electrostatic capacity detector and mutual correlation method, the improvement comprising a first common electrode mounted proximate the outerwall of said pipe and extending along a certain length of said pipe on one side of said pipe, a pair of second and third electrodes mounted proximate said outerwall opposite said first common electrode for detecting the fluid flow velocity, each of said pair of electrodes extending along only a small portion of said certain length, and a fourth electrode for detecting the fluid density mounted proximate said outerwall opposite said common electrode, said fourth electrode extending along said outerwall upstream and downstream of each of said pair of electrodes and extending along said outerwall a greater length than said pair of electrodes.

4,509,367

TACHOMETER GENERATOR INDEXING DEVICE

Joe A. McInturff, and David W. Patterson, both of Marietta, Ga., assignors to Lockheed Corporation, Burbank, Calif.

Filed May 9, 1983, Ser. No. 493,063
Int. Cl.³ G01M *1/00*
U.S. Cl. 73—457 **7 Claims**

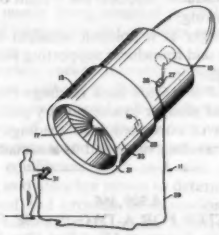
1. In a machine having a rotor with a plurality of associated fan blades, a housing, an accelerometer, and a generator connected to the machine for generating a continuous sinusoidal output signal proportional to the position and speed of the associated rotor, an indexing device comprising:

(a) connection means for operatively connecting said device to the output of the generator;

(b) detector means for detecting a predetermined output from said generator, said predetermined output being the zero crossover point of the sinusoidal output signal of said generator going from negative to positive;

(c) an indicator for providing a stroboscopic flash each time said detector means has detected said predetermined output from said generator;

(d) a predetermined point on the housing of the machine for indicating the mounting position of the accelerometer;



(e) said indicator being adapted to be oriented to a position adjacent to said predetermined point on the housing;

whereby said indicator is positioned relative to the mounting position of the accelerometer so as the rotor is turned, said indicator is activated when said predetermined output is detected, and illuminates the particular fan blade that is passing by the accelerometer position so that an operator can physically index the angular position of the rotor to said predetermined output from said generator as well as said predetermined point on the housing.

4,509,368

ULTRASOUND TOMOGRAPHY

James F. Whiting, Indooroopilly, and Rolf H. L. Koch, Bardon, both of Australia, assignors to The Commonwealth of Australia, Australian Capital Territory, Australia

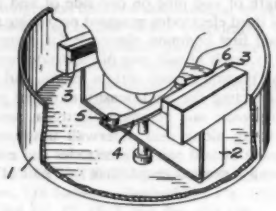
PCT No. PCT/AU82/00098, § 371 Date Feb. 17, 1983, § 102(e) Date Feb. 17, 1983, PCT Pub. No. WO83/00009, PCT Pub. Date Jan. 6, 1983

PCT Filed Jun. 18, 1982, Ser. No. 467,481

Claims priority, application Australia, Jun. 22, 1981, PE9381

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—624 **10 Claims**



1. An apparatus for examining the internal structure of a body along mutually perpendicular planes of interest, comprising:

means for transmitting pulses of ultrasonic energy through said body along a plurality of substantially parallel paths in a first plane;

means for receiving ultrasonic energy pulses transmitted through said body in said first plane;

means for transmitting pulses of ultrasonic energy into said body along a second plane perpendicular to said first plane;

means for receiving ultrasonic energy pulses reflected by said body along said second plane;

and means for correlating acoustic transmission and reflection data for reconstruction of one or more images corresponding to said first plane.

4,509,369

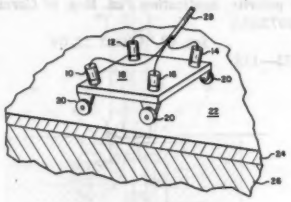
NEAR SURFACE INSPECTION SYSTEM

Zoran Kuljis, Zagreb, Yugoslavia, and John P. Lareau, Granby, Conn., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed Aug. 25, 1983, Ser. No. 526,187

Int. Cl.³ G01N *29/04*

U.S. Cl. 73—628 **11 Claims**



1. An ultrasonic inspection system for detecting the presence of flaws in a zone of interest surrounding a focal point disposed a preselected distance beneath a substantially planar surface of a solid material, said solid material being immersed in a sonic conducting medium, comprising:

a carrier for transporting said inspection system over the surface while maintaining a constant, fixed spacing therebetween;

an ultrasonic transmitter, secured to said carrier, for directing a beam of ultrasonic sound radiation through said medium and into said solid material toward said zone of interest, said transmitter further being oriented with respect to the surface so as to result in the formation of an included angle of approximately 20° between the beam path traveling within said material and said planar surface;

a first ultrasonic receiver, secured to said carrier, for receiving reflected ultrasonic sound originating as a result of the presence of a flaw within said zone of interest, said first receiver being oriented with respect to the surface of said material so as to receive only reflected sound originating within said zone of interest and traveling through said solid material along a reflected sound path forming an included angle of approximately 20° with said planar surface; and

a second ultrasonic receiver, secured to said carrier, for receiving reflected ultrasonic sound originating as a result of the presence of a flaw within said zone of interest, said second receiver being oriented with respect to said planar surface of said material so as to receive only reflected sound originating within said zone of interest and traveling through said material along a reflected sound path forming an included angle of approximately 20° with said planar surface.

4,509,370

PRESSURE-SENSITIVE OPTRODE

Tomas B. Hirschfeld, Livermore, Calif., assignor to Regents of the University of California, Berkeley, Calif.

Filed Sep. 30, 1982, Ser. No. 430,578

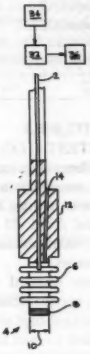
Int. Cl.³ G01B *11/00*; G01L *7/06*

U.S. Cl. 73—705 **15 Claims**

1. An apparatus for sensing changes in pressure and for generating optical signals related to said changes in pressure, the apparatus comprising:

(a) a fiber optic through which light from at least one associated light source is transmitted from a first end of the fiber optic to a second end of the fiber optic;

(b) resilient means operationally associated with the second end of the fiber optic, the resilient means having a movable surface which moves relative to the second end of the fiber optic along an axis of the fiber optic in response to changes in pressure and the movable surface having a fluorescent composition attached to one side such that light transmitted by the fiber optic impinges on the fluorescent composition, causing it to generate an optical signal;



(c) a beam splitting means adjacent to the first end of the fiber optic for separating light from at least one associated light source from the optical signal generated by the fluorescent composition and transmitted by the fiber optic; and

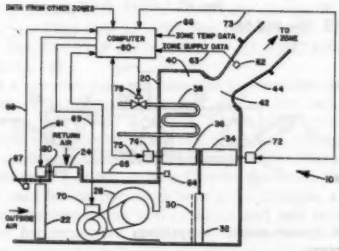
(d) detection means adjacent to the beam-splitting means for collecting and analyzing the optical signal generated by the fluorescent composition and transmitted by the fiber optic.

4,509,371

VENTURI FLOW MEASURING DEVICE AND METHOD

Donald C. Wellman, Marcellus, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Jan. 7, 1983, Ser. No. 456,633
Int. Cl.³ G01F *1/00*
U.S. Cl. 73—861 **5 Claims**



1. A method for determining the variable volume flow rate of a fluid subject to varying temperature, pressure and flow paths comprising the steps of:

directing all of the fluid into a single fluid path;

passing all of the fluid in the single fluid path through a converging-diverging section to stabilize by sequentially accelerating and decelerating the fluid flow therethrough;

selecting a single point from a plurality of axially spaced predetermined locations along said diverging section at points of differing cross-sectional area for measuring the velocity of fluid flow so that the measured velocity is within a predetermined range; and

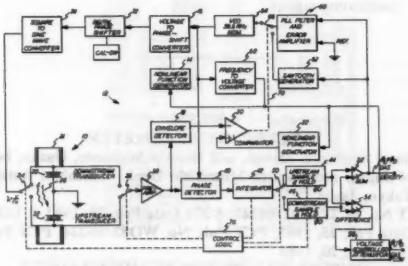
measuring the velocity of fluid flow at said single point whereby the variable volume rate of flow is the product of the measured velocity and the cross sectional area at that location.

4,509,372

ACOUSTICAL WAVE FLOWMETER WITH INCREASED DENSITY CAPABILITY

Bruce E. Mount, Diamond Bar, Calif., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Apr. 4, 1983, Ser. No. 482,104
Int. Cl.³ G01F *1/66*
U.S. Cl. 73—861.28 **15 Claims**



12. A phase-locked loop system for measuring fluid flow by detecting phase differences between a transmitted and received signal within a confined path having a voltage controlled oscillator,

applying signals at a given frequency from said voltage controlled oscillator to said fluid in said flow path,

a phase detector for detecting the phase difference between the received signal and the transmitted signal,

means for generating an error voltage corresponding to said detected phase difference between the transmitted and received signal and applying said error voltage to said voltage controlled oscillator so that said transmitted signal will be maintained in operating phase with the received signal, and

means for varying the operating phase between said transmitted signal and said received signal in a continuous manner according to a predetermined relationship of acoustic resonance of the confined path with fluids of different densities therein, wherein said means for varying is coupled to control the phase of said signals from said voltage controlled oscillator in cooperation with said means for generating an error voltage.

4,509,373

CALIBRATION CIRCUIT FOR ULTRASONIC FLOWMETER

Alvin E. Brown, Santa Cruz, Calif., assignor to Manning Technologies, Inc., Scotts Valley, Calif.

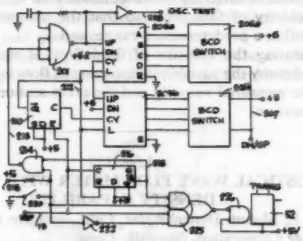
Filed Jun. 9, 1983, Ser. No. 502,485
Int. Cl.³ G01F *1/66, 25/00*
U.S. Cl. 73—861.28 **7 Claims**

1. In a flowmeter of the type using upstream and downstream acoustic signals to measure flow by means of early and late arrival of acoustic signals in comparison to a reference, a calibration circuit comprising,

phase detector means comparing a received acoustic signal

input against a variable delay calibration signal input for generating early and late output signals, and

means for generating a frequency counted variable delay,



said variable delay means connected in series to a fixed delay means, the output of said fixed delay means connected to said phase detector means as said variable delay calibration signal.

4,509,374

ELECTRIC DYNAMOMETER

Akinori Sugimoto, Hyogo, and Hiroshi Sugimoto, Osaka, both of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

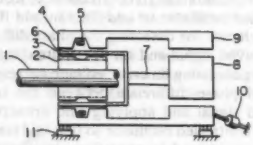
PCT No. PCT/JP82/00247, § 371 Date Feb. 25, 1983, § 102(e) Date Feb. 25, 1983, PCT Pub. No. WO83/00224, PCT Pub. Date Jan. 20, 1983

PCT Filed Jun. 28, 1982, Ser. No. 474,644

Claims priority, application Japan, Jun. 30, 1981, 56-102795

Int. Cl.³ G01L *3/22*

U.S. Cl. 73—862.17 **1 Claim**



1. An electric dynamometer, comprising:

(a) a rotatable shaft;

(b) a first rotor mounted for conjoint rotation with said shaft;

(c) a first stator surrounding said first rotor, said first stator including a dynamometer yoke surrounding said first rotor in radially spaced relation therewith, and a loss drum between said dynamometer yoke and said first rotor, rotatable through 360° about said first rotor;

(d) an electric rotor including a second rotor and a second stator surrounding said second rotor, said second rotor being coupled to said loss drum so as to rotate said loss drum therewith about said first rotor, said second stator being fixed to said dynamometer yoke so as to define in combination with said dynamometer yoke a combined yoke surrounding said first and second rotors;

(e) means for supporting said combined yoke for rotation about said first and second rotors; and

(f) means, including a torque detector connected to said combined yoke, for measuring the combined torque exerted on said dynamometer yoke and said second stator about said first and second rotors.

4,509,375

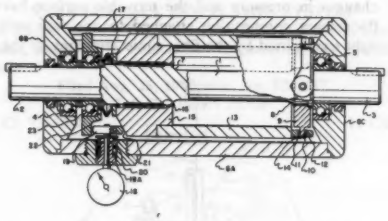
TORQUE METER

Toby L. Davis, 3406 Karen Ct., Arlington, Tex. 76014

Filed Sep. 29, 1982, Ser. No. 428,303

Int. Cl.³ G01L *3/04*

U.S. Cl. 73—862.32 **3 Claims**



1. An apparatus for measuring torque, comprising:

first and second shaft means spaced axially from each other,

said second shaft means having an aperture formed therethrough,

a tubular torque sensitive means connected between said first and second shaft means,

axially movable means located within said aperture and within said tubular torque sensitive means and having a first end coupled to said first shaft means,

first cam means coupled to said first shaft means,

means for allowing said first cam means to move axially relative to said first shaft means,

second cam means connected to said second shaft means,

said first and second cam means having first and second surfaces respectively engaging each other for causing said first cam means to move axially when torsion of said tubular torque sensitive means occurs upon the application of torque to one of said shaft means,

means coupling said first cam means to said axially movable means for causing said axially movable means to move axially when said first cam means moves axially,

and means for measuring the axial displacement of said axially movable means.

4,509,376

SAFE LOAD INDICATOR

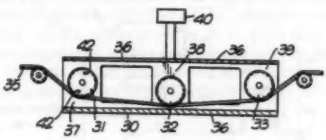
William R. Thomasson, Houghton-le-Spring, England, assignor to Coles Cranes Limited, Sunderland, England

Division of Ser. No. 149,376, May 13, 1980, Pat. No. 4,368,824. This application Sep. 24, 1982, Ser. No. 423,366

Claims priority, application United Kingdom, May 18, 1979, 7817405

Int. Cl.³ G01L *5/04*

U.S. Cl. 73—862.56 **11 Claims**



1. A dynamometer comprising:

a frame;

rope deflecting means, including a second rotatable member, mounted to said frame;

first and third rotatable members mounted to said frame on either side of said second rotatable member, said first and third rotatable members being out of alignment with said second rotatable member;

said frame including three mounting blocks, each block

carrying one of said rotatable members and each block being connected to the other in line by a pair of resiliently flexible portions;

a rope, the tension of which is to be measured, rove past said first and third rotatable members and in bearing contact with said second rotatable member to be deflected by said second rotatable member;

a load cell mounted to said frame and arranged to measure the deflection force of said rope against said second rotatable member; and

wherein at least one of said rotatable members is provided with indicating means radially spaced from its axis, and wherein the frame is provided with detector means arranged to detect the passage of said indicating means past said detector means, said detector means being enabled to transmit at least the rope movement direction to a microprocessor.

4,509,377

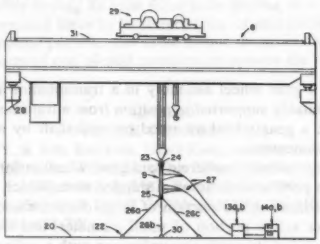
LOAD TESTING

Walter J. Mentzell, Upper Burrell Township, Westmoreland County, Pa., and Oscar L. Ganoe, Pennsville, N.J., assignors to Mentzell Electric Co., Inc., Apollo, Pa.

Filed Nov. 19, 1982, Ser. No. 443,015

Int. Cl.³ G01L *5/00*; G01M *19/00*

U.S. Cl. 73—862.56 **9 Claims**



1. A method of testing the load lifting ability of a lifting device, comprising connecting the lifting device to a securement able to resist more force than a weight for which the lifting device is to be tested, operating the lifting device until the force exerted by the lifting device on the securement equals said weight, and displacing the lifting device under load for performing a moving load test.

4,509,378

RECIPROCATING MACHINES WITH BOTH PRIMARY AND SECONDARY COUNTER ROTATING BALANCERS

Arthur E. Brown, R.D. 1, Box 1107, Lake George, N.Y. 12845

Filed Feb. 22, 1983, Ser. No. 468,139

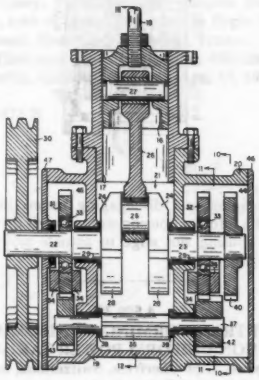
Int. Cl.³ F16F *15/26*; F16H *21/22*; F16C *3/04*

U.S. Cl. 74—44 **7 Claims**

1. In a reciprocating machine, the combination of a frame structure, a reciprocable member guided for reciprocation relative to said frame structure, a crankshaft mounted for rotation in the frame structure, said crankshaft having a center throw crank with a first main shaft on one side of the crank and a second main shaft on the other side of the crank, said center throw crank having two crank arms and a crankpin, a connecting rod interconnecting said crankpin and said reciprocable member for respective rotary and reciprocative motion, at least one main counterweight attached to said crankshaft and rotatable therewith,

a first countershaft mounted for rotation offset from said crankshaft, a second countershaft mounted for rotation offset from said crankshaft, positive toothed gearing for driving both of said countershafts at twice the RPM of said crankshaft and in opposite directions of rotation from each other, a secondary balance weight mounted on each of said countershafts and rotatable therewith, said two secondary weights serving to counterbalance the secondary reciprocating inertia force of said reciprocable member,

a first contraweight mounted for rotation around said first main shaft, a second contraweight mounted for rotation around said second main shaft, said two contraweights being adapted to both rotate at the same RPM as said crankshaft but in the opposite direction from that of the crankshaft, said main counterweight and said two contraweights combining so as to counterbalance the primary reciprocating inertia force of said reciprocable member, and wherein the improvement comprises:



positive toothed gearing rotatably and directly interconnecting one of said countershafts and said first contraweight such that the countershaft drives the first contraweight with a two to one speed reduction,

positive toothed gearing rotatably and directly interconnecting one of said countershafts and said second contraweight such that the countershaft drives the second contraweight with a two to one speed reduction, and at least one of said countershafts thus serving a multifunction purpose which is to: (a) serve as a shaft for holding and rotating a secondary counterweight and (b) to serve as a transmission for driving one of said contraweights.

4,509,379

ROTARY TO RECIPROCATING MOTION CONVERTER

Julius C. Westmoreland, 4600 Via Dolce, #104, Marina del Rey, Calif. 90291

Filed May 3, 1982, Ser. No. 374,082

Int. Cl.³ F04B *21/02*, *39/08*

U.S. Cl. 74—58 **9 Claims**

1. A converter of rotary power input to a reciprocating motion output, comprising:

a housing having a sidewall and open ends, said sidewall including at least one slot therein;

a drive shaft having one end connected to the rotary power input and including a first portion with an external right-hand thread and a second portion with a left-hand thread;

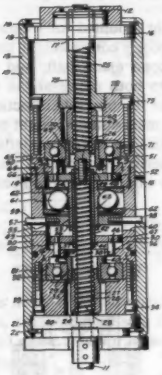
first and second nut means threaded onto the respective right-hand and left-hand shaft portions in a spaced apart relation along said shaft;

first and second clutch means respectively interconnected with said first and second nut means;

means slidably received within said housing and interconnected with said nut means for unitary movement therewith; and

means slidably received on the drive shaft between said first and second nut means for cyclically engaging the first

clutch means while simultaneously disengaging the second clutch means and disengaging the first clutch means while simultaneously engaging the second clutch means,



said engaging and disengaging means including a pin extending into the housing slot which is driven on contact with a housing slot edge to actuate said engaging and disengaging means.

4,509,380

GEAR UNIT TRANSFORMING A UNIFORM DRIVER TO A NON-UNIFORM POWER TAKE-OFF

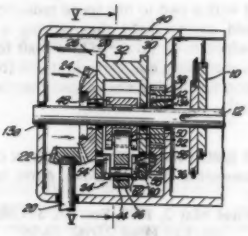
Francisco Speich, Gipf-Oberfrick, Switzerland, assignor to Textilma AG, Hergiswil, Switzerland

Filed Dec. 22, 1981, Ser. No. 333,476

Claims priority, application Switzerland, Dec. 30, 1980, 9630/80

Int. Cl.³ F16H *35/02*

U.S. Cl. 74—394 **8 Claims**



1. A gear unit for generating a non-uniform power take-off from a uniform drive, such as for the shedding mechanism of a weaving machine useful in a ribbon weaving machine, comprising an axially extending rotatable power take-off shaft, a stationary sun gear coaxial with said power take-off shaft, a driving member rotatably mounted on said power take-off shaft and the axis of said driving member is coaxial with said sun gear, means for uniformly driving said driving member, a crankshaft mounted in said driving member, a planet pinion in meshed engagement with said sun wheel and connected to said crankshaft, said crankshaft including a crank pin, a swing arm connected to said power take-off shaft for rotation therewith, a connecting element connected to said crank pin and to said swing arm, wherein the improvement comprises that means for supporting said power take-off shaft comprising a pair of bearings spaced apart in the axial direction of said power take-off shaft said driving member is formed as a driving cage comprising a pair of side walls rotatably supported on and spaced apart in the axial direction of said power take-off shaft and located between said pair of bearings, said crankshaft extending between and supportably mounted in said side walls, said connecting element hinged to said crank pin of said crankshaft, and a bolt supported in said swing arm, said bolt connects said connecting element to said swing arm.

4,509,381

SPLINED PRESS FIT CONNECTION IN GEAR WHEEL ASSEMBLY

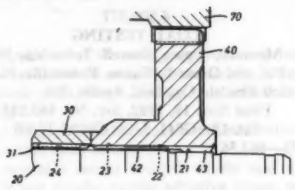
Kazuhito Ikemoto; Yukio Terakura; Takashi Miyake, and Takashi Yamamoto, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Dec. 15, 1982, Ser. No. 450,000

Claims priority, application Japan, Dec. 26, 1981, 56-210858

Int. Cl.³ F16H *1/06, 1/20*

U.S. Cl. 74—413 **2 Claims**



1. In a gear wheel assembly in a transmission including a shaft rotatably supported in position from a transmission housing, and a gear wheel mounted on said shaft by means of a spline connection,

the improvement wherein said gear wheel is formed at its hub portion with an axial stepped bore, which includes a first inner spline portion of large diameter and a second inner spline portion of small diameter, and said shaft is formed at its outer circumference with a cylindrical portion engaged with a cylindrical portion engaged with the second inner spline portion of said gear wheel with a press fit, a first outer spline portion slidably engaged with the first inner spline portion of said gear wheel, and a second outer spline portion engaged with the first inner spline portion of said gear wheel with a press fit, the cylindrical portion, the first outer spline portion and the second outer spline portion being formed axially in sequence, and wherein said gear wheel is mounted on said shaft in such a manner that the first inner spline portion of said gear wheel is loosely engaged with the first outer spline portion of said shaft and fixedly engaged by a press fit with the second outer spline of said shaft, and the second inner spline portion of said gear wheel is fixedly engaged by a press fit with the cylindrical portion of said shaft.

4,509,382

PRELOADED SCREW ACTUATOR

Albert J. Colautti, Windsor, Canada, and Hans J. Borlinghaus, Utica, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Mar. 25, 1983, Ser. No. 478,660

Int. Cl.³ F16H *1/20*

U.S. Cl. 74—424.8 R **5 Claims**

1. An actuator comprising threadedly engaged screw and nut members,

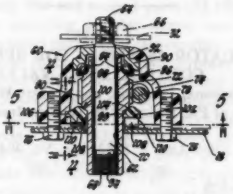
housing means defining an axis,

one of said members disposed on said axis and having an axially spaced pair of bearing surfaces with one thereof mounted against the housing means,

means defining a support surface adjacent the other of said bearing surfaces,

the other of said members adapted to be connected with a load to be actuated,

a one piece resilient bearing operative to preload said one member against the housing means with force applied up to a predetermined maximum axially thereof and comprising a molded body of low friction polymeric material formed with a main portion engaged with the other bearing surface of said one member and adapted to sustain substantially without deformation at least said predetermined force, said body being further formed with a yieldable portion engaged with said support surface and deflected along said axis under preload force a distance no greater than the distance corresponding to said predetermined force,



abutment stop means operable under a force on said one member having an axial force at or greater than said predetermined force to limit deflection of said resilient bearing elastic portion, and drive torque means connected for rotation of one of said members to actuate the load.

4,509,383

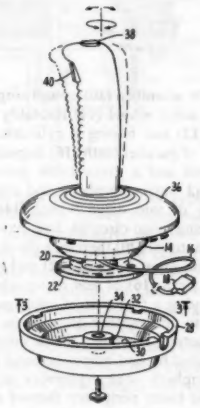
JOYSTICK CONTROLLER

Gregory Y. S. Yeh, Kowloon, Hong Kong, assignor to Championship Electronics (USA) Inc., San Mateo, Calif.

Filed Dec. 1, 1982, Ser. No. 446,066

Int. Cl.³ G05G *9/00*; H01H *25/04*; B65H *75/40*; H02G *11/00*

U.S. Cl. 74—471 XY **4 Claims**



1. In a joystick controller of the type having a handle pivotally mounted in a base for selective movement about a pivotal axis from a nominal rest position for selectively generating switch closures; a cord from said base for carrying electrical signals from said switch closures, wherein the improvement comprising:

a ring having an inner radius and an outer radius

a spacer for positioning said ring spaced apart from said base; one end of said spacer attached to said ring, the other end of said spacer attached to said base; and

a housing for enclosing said base, said spacer, and said ring; said housing having a substantially planar surface with a radius of curvature greater than the outer radius of said ring; a substantially cylindrically shaped member having a radius of curvature less than said inner radius being positioned near the center of said surface; said housing with said member being engaged with said ring disposed over said member and resting against said surface;

whereby the rotation of said handle about said pivotal axis winds and unwinds said cord from said controller.

4,509,384

MANUAL GEARBOX RATIO CHANGE CONTROL DEVICE

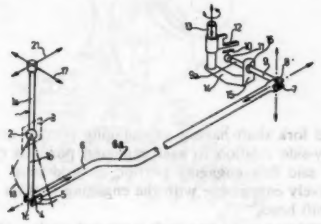
Jean-Michel Lamy, Paris, and Jean-Jacques Boutant, Rueil Malmaison, both of France, assignors to Regie Nationale des Usines Renault, Boulogne-Billancourt, France

Filed Aug. 13, 1982, Ser. No. 408,120

Claims priority, application France, Aug. 14, 1981, 81 15745

Int. Cl.³ G05G *9/18*

U.S. Cl. 74—473 R **6 Claims**



1. A manual device for controlling the gear ratio changes of an automotive vehicle gearbox, comprising a manually operated control lever provided with a fixed swivel point, a gear change peg installed inside the gearbox and capable of undergoing a rotary movement round a control shaft axis and the translational movement along the said shaft axis, and a change rod connected by one of its ends to the control lever in order to transmit the movements of the control lever to the change peg, the change rod being connected at one of its ends to the manual control lever by a joint with one degree of freedom in rotation and at its other end, by a joint with one degree of freedom in rotation, to a demultiplication device installed at least partially inside the gearbox, the fixed joint point of the control lever being so placed on said control lever that the demultiplication due to the control lever is about 1.5, with the whole device producing a total demultiplication in the order of 6 to 7.

4,509,385

CONSTRUCTION FOR PREVENTING WEAR OF SHIFT FORK IN TRANSMISSION MANIPULATION DEVICE FOR MANUAL TRANSMISSION

Masaki Inui, and Yasuyoshi Yasui, both of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

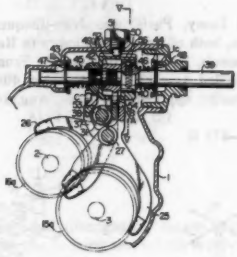
Filed Dec. 27, 1982, Ser. No. 452,968

Int. Cl.³ G05G *5/10, 9/18*

U.S. Cl. 74—477 **1 Claim**

1. A transmission comprising a transmission case, a first fork shaft and a second fork shaft, said second fork shaft being axially movably and nonrotatably mounted within said transmission case, a plurality of shift forks axially movably and rotatably provided on said first fork shaft, each said shift fork having engaging portions aligned in a direction perpendicular to a longitudinal axis defined by said fork shafts, a shift and select lever shaft axially movably and rotatably carried by said transmission case and extending in a direction perpendicular to

said longitudinal axis of said fork shafts, a resilient member through which said lever shaft is held in a neutral position, a first retaining portion provided on said lever shaft and selectively engageable with the engaging portion of one of said shift forks, a first shift head fixed to said first fork shaft having an engaging portion arranged in a side-by-side relation to said engaging portions of said shift forks, a second retaining portion provided on said lever shaft being engageable with the engaging portion of said first shift head only when said first retaining portion is in engagement with the engaging portion of any one of said shift forks on said first fork shaft, a single shift fork fixed to said second fork shaft, and a second shift head fixed to said



second fork shaft having an engaging portion arranged in a side-by-side relation to said engaging portions of said shift forks, said first engaging portion on said lever shaft being selectively engageable with the engaging portion of said second shift head,

whereby as said lever shaft is rotated while said lever shaft has been moved axially against the force of said resilient member to hold said first retaining portion in engagement with the engaging portion of said second shift head, said second retaining portion is retained by said first shift head to prevent the axial movement of said lever shaft due to repulsive forces of said resilient member and thereby prevent wear of said shift forks.

4,509,386

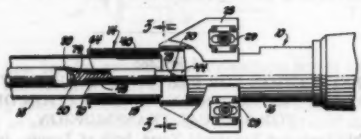
LASH-FREE TELESCOPIC STEERING SHAFT ASSEMBLY AND METHOD OF MAKING THE ASSEMBLY

Dan R. Kimberlin, Frankenmuth, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 15, 1982, Ser. No. 441,498

Int. Cl.³ B62D *1/18*; F16D *3/06*; B21D *53/10*

U.S. Cl. 74—492 **5 Claims**



1. An energy absorbing steering column collapsible in an energy absorbing mode of operation from an extended length to a collapsed length comprising a mast jacket assembly incorporating energy absorbing means therein, a steering shaft assembly operatively mounted within said mast jacket assembly, said steering shaft assembly having first and second shaft members mounted for relative telescopic sliding movement with respect to one another from an initial position to a shortened position when said column collapses in an energy absorbing mode of operation and rotatable as an assembly in a steering mode of operation said steering shaft assembly having ball means operatively interposed therein and operative in said energy absorbing mode of operation to move in linear track means in said first and second shaft members, said track means being directly formed in said first and second shaft members by said ball means when said steering shaft assembly is initially telescoped to said shortened position and returned to said initial position, said ball means being normally operative to drivingly interconnect said members for the transmission of steering torque with minimized lash in response to turning input to one of said steering shaft members.

4,509,387

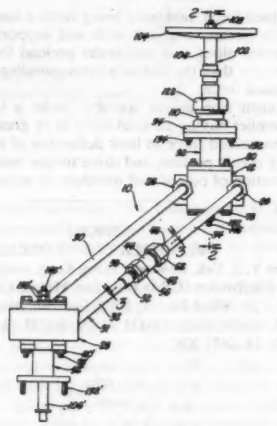
ACTUATOR ASSEMBLY FOR REMOTELY CONTROLLING A VALVE

August E. Tschanz, Lansdale, and Robert W. Geiger, Geigertown, both of Pa., assignors to Teleflex Incorporated, Limerick, Pa.

Filed Aug. 2, 1982, Ser. No. 404,464

Int. Cl.³ G05G *1/08*

U.S. Cl. 74—505 **16 Claims**



1. An actuator assembly (**10**) comprising; an input housing (**12**), a circular drive wheel (**14**) rotatably supported by said input housing (**12**) and having a cylindrical outer periphery with a plurality of parallel teeth (**16**) disposed about said outer periphery thereof and a drive cable groove (**18**) extending radially into said outer periphery and circularly about said outer periphery of said drive wheel (**14**), said drive cable groove (**18**) being semi-circular and having a plurality of equally spaced notches (**20**) therein, a drive gear (**22**) rotatably supported by said input housing (**12**) and in meshing engagement with said teeth (**16**) of said drive wheel (**14**), said input housing (**12**) having a first pair of cable guide tubes (**24**) disposed opposite to one another on opposite sides of said drive gear (**22**); an output housing (**28**), a circular driven wheel rotatably supported by said output housing and having a cylindrical outer periphery with a plurality of parallel teeth disposed about said outer periphery thereof and a driven cable groove extending radially into said outer periphery and circularly about said periphery of said driven wheel, said driven groove being semi-circular and having a plurality of equally spaced notches therein; a driven gear rotatably supported by said output housing (**28**) and in meshing engagement with said teeth of said driven wheel, said output housing (**28**) having a second pair of cable guide tubes disposed opposite to one another on opposite sides of said driven gear; a first conduit (**30**) connected to and extending between one of said guide tubes (**24**) of said input housing (**12**) and one of said guide tubes of said output housing (**28**); a second conduit (**31**) connected to and extending between the other guide tube (**24**) of said input housing (**12**) and the other guide tube of said output housing

(28); and endless flexible motion transmitting core element (38) slidably disposed in said first and second conduits (30,31) and said guide tubes (24) and entrained about said drive (14) and driven wheels, said core element (38) being circular and disposed in said grooves (18) in said drive (14) and driven wheels, said core element (38) having spaced radial protrusions therealong for engaging said notches (30) in said grooves (18) of said drive (14) and driven wheels so that said core element (38) moves longitudinally to rotate said drive (14) and driven wheels in a closed all-tension system, at least one of said conduits (31) including first and second parts (32,34); and adjustment means (42) including a slider sleeve member (44) for sliding over said second part (34) of said conduit (31) when not secured thereto and spacer means (60) disposed within said slider sleeve member (44) for spacing apart said first and second parts (32,34) of said conduit (31) and adjustable connecting means for fixedly connecting said slider sleeve member (44) to said first and second parts (32,34) whereby said adjustable connecting means can be released to allow said slider sleeve member (44) to slide over said second part (34) and said spacer means (60) can be removed to allow access to said core element (38).

4,509,388

DIFFERENTIAL GEAR

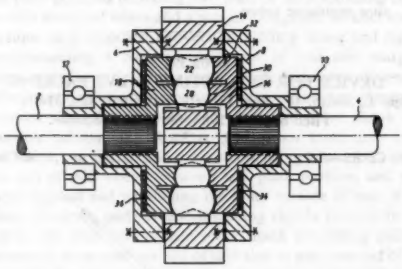
Theodoros Tsiriggakis, Athens, Greece, assignor to Greek Powder and Cartridge Co., S.A., Hymettus, Greece

Filed May 12, 1982, Ser. No. 377,591

Claims priority, application Fed. Rep. of Germany, May 21, 1981, 8115191[U]

Int. Cl.³ F16H *35/04*

U.S. Cl. 74—650 19 Claims



1. In a differential gear assembly of the type including two axially aligned shafts and a power transmission element for transmitting rotary motion of a drive motor to said two shafts via gear connections, the improvement comprising:

two cam track disks mounted to rotate with respective said shafts and to rotate coaxially of said power transmission element and relative thereto, said cam track disks having respective axially facing surfaces;

each said cam track disk having on said respective surface thereof at least one circumferentially extending cam track having a contour of axial height varying circumferentially;

at least two circumferentially spaced rolling elements bearing on facing said cam tracks of respective said cam track disks;

each said rolling element being positioned within a recess formed in said power transmission element and having an axis of rotation extending radially with respect thereto;

means for mounting each said rolling element on said power transmission element to enable rotation of said rolling element about said axis thereof; and

means for guiding said mounting means for movement axially relative to said power transmission element, thereby enabling movement of said rolling element axially of said power transmission element upon relative rotation of said power transmission element with respect to said cam track disk.

4,509,389

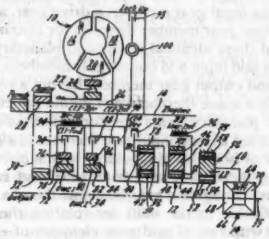
FOUR SPEED RATIO TRANSAXLE WITH OVERDRIVE

Adam Vahratian, Livonia; Roosevelt Maynard, Jr., Birmingham, both of Mich.; Howard L. Croswhite, Thousand Oaks, Calif., and Po-Lung Liang, Livonia, Mich., assignors to Ford Motor Company, Dearborn, Mich.

Continuation-in-part of Ser. No. 164,869, Jul. 1, 1980, Pat. No. 4,368,649. This application Dec. 6, 1982, Ser. No. 447,065

Int. Cl.³ F16H *37/08, 47/08, 37/06, 57/10*

U.S. Cl. 74—695 4 Claims



1. In an automatic transaxle for an automotive vehicle having an engine driven torque input shaft and a driven shaft arranged in offset, parallel relationship;

a hydrokinetic torque converter having a turbine and an impeller mounted for rotation about the axis of said torque input shaft, a turbine driven shaft driven by said turbine;

a planetary gear system comprising two simple planetary gear units mounted for rotation about the axis of said driven shaft, each gear unit having a sun gear, a ring gear and a planet pinion carrier, a torque output element of said gear system being connected to the ring gear of the first of said gear units and the carrier of the second of said gear units, the carrier of the first of said gear units being connected to the ring gear of the second of said gear units;

final drive gearing connecting drivably said torque output element with said driven shaft;

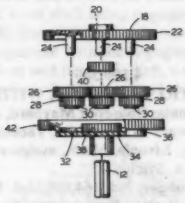
first, second and third clutch means for delivering torque through said gear system comprising a clutch sleeve shaft driven by said turbine driven shaft, said first clutch means comprising a first overrunning coupling and a first friction clutch in series, said first friction clutch being located between said clutch sleeve shaft and said first overrunning coupling in the torque flow path between said clutch sleeve shaft and the sun gear of said first gear unit, said second clutch means comprising a second friction clutch adapted to connect said sleeve shaft to the carrier of said first gear unit, said third clutch means comprising a second overrunning coupling and a third friction clutch in series, said third friction clutch being located between said clutch sleeve shaft and said second overrunning coupling in the torque flow path between said clutch sleeve shaft and the sun gear of said first gear unit;

first brake means for braking the sun gear of the first of said gear units, second brake means for braking the sun gear of the second of said gear units and third brake means for braking the carrier of the first of said gear units.

4,509,390
DIFFERENTIAL SUMMING MECHANISM

Richard L. Hockmuth, Avon, Conn., assignor to Petroleum Meter & Pump Co., Inc., Avon, Conn.

Filed Dec. 30, 1982, Ser. No. 453,331
Int. Cl.³ F16H 37/06; B67D 5/22
U.S. Cl. 74—705 7 Claims



1. A compact rotary summing mechanism comprising: a generally planar input gear member, a drive gear, and a generally planar output gear member disposed for coaxial mounting on a shaft; and three identical compound planetary gears disposed between said input and output gear members, at least one of said input and output gear members having a recessed portion to provide a space therebetween within which said drive gear and said planetary gears are contained, said planetary gears being carried by said input gear member in a relationship to one another of isosceles triangularity and in circumferential meshing engagement with said drive gear, and each of said planetary gears having two gear elements thereon, said drive gear being affixable to the shaft for rotation therewith and being meshed with one of said gear elements of each of said planetary gears, said input and output gear members being rotatable on the shaft, and having tooth formations extending about the entire outside circumference thereof and lying in close axial proximity to one another, said output gear member also having an internal tooth formation extending entirely about an inside circumferential portion thereof and meshed with the other gear elements of said planetary gears, whereby said summing mechanism will combine rotary inputs from the shaft and said input gear member to generate a cumulative rotary output from said output gear member.

4,509,391
HYDRAULIC PRESSURE REGULATING SYSTEM FOR A VEHICLE AUTOMATIC TRANSMISSION

Koji Sumiya, and Kojiro Kuramochi, both of Aichi, Japan, assignors to Aisin Warner Kabushiki Kaisha, Anjo and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Nov. 18, 1981, Ser. No. 322,611
Claims priority, application Japan, Nov. 23, 1980, 55-167991
Int. Cl.³ B60K 41/10
U.S. Cl. 74—869 4 Claims

1. A hydraulic pressure regulating system for use in a automatic transmission associated with an engine having an intake throttle opening, said automatic transmission having a fluid coupling type torque converter, a gear system with a number of friction elements to establish two or more speed ratios, and a hydraulic control system comprising:

a fluid reservoir;

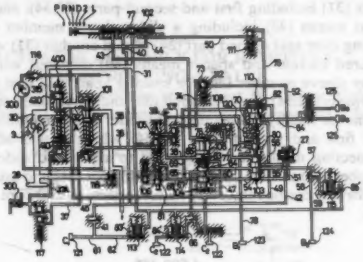
a pump for pumping fluid from said reservoir and for supplying pressurized fluid to said hydraulic control system;

a first pressure regulator valve for regulating the discharge pressure of said pressurized fluid from said pump and supplying said pressure regulated fluid as a controlled line pressure to said hydraulic control system;

a throttle valve for generating a throttle pressure, said throttle pressure varying in accordance with the intake throttle opening of said engine;

a second pressure regulator valve for regulating the fluid pressure of a portion of said fluid supplied to said hydraulic control system, said second pressure regulator valve being adapted to supply said portion of fluid to said torque converter at a regulated pressure commensurate with both the throttle pressure and the line pressure;

passage means for supplying said throttle pressure to the second pressure regulator valve and an inlet of said first pressure regulator valve, said first pressure regulator valve being adapted to vary said line pressure commensurately with said throttle pressure;



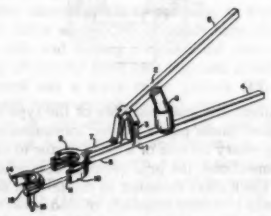
a pressure relief valve provided in said passage means for relieving the fluid pressure in said passage means when the fluid pressure in said passage means is in excess of a preselected level; and

a throttle modulator valve provided in said passage means, said throttle modulator valve being upstream of said pressure relief valve and downstream from said second pressure regulator valve.

4,509,392
DEVICE FOR EXTRACTING VALVE PACKING

Edgar L. Smith, 102 East Liberty, Savannah, Ga. 31401

Filed Sep. 19, 1983, Ser. No. 533,800
Int. Cl.³ B25B 27/00
U.S. Cl. 81—8.1 4 Claims



1. A device for cutting and extracting packing from around a shaft comprising a pair of elongated levers disposed in opposed, spaced relationship to one another and connected by fulcrum means disposed between the levers at respective points intermediate the ends thereof, one pair of the respective opposing portions of the levers on one side of said fulcrum means forming handles such that compression thereof causes the other opposing portions of the levers on the other side of the fulcrum to separate, one of the ends of said other opposing portions being provided with a semicircular collar means for partially, slidably encircling the shaft from which packing is to be removed, said collar having a plane perpendicular to the plane of movement of said levers, second semicircular collar means being disposed on the opposing end of said other lever and adapted to also slidably encircle a portion of said shaft and to hold elongated means for cutting and removing packing

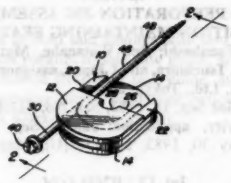
from around said shaft, said cutting means being adapted to fit in said second collar and project downward therefrom parallel to said shaft such that compression of the handle portion of said levers causes said elongated cutting means to be displaced downward along side shaft and to penetrate padding disposed around said shaft and below the collar.

4,509,393

DRIVE ATTACHMENT FOR J-HOOK

Frank J. Castiglione, P.O. Box 651, Cape Coral, Fla. 33910

Filed Mar. 4, 1983, Ser. No. 472,115
Int. Cl.³ B25B *13/48*
U.S. Cl. 81—121 A 4 Claims



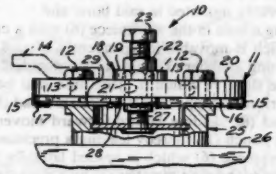
1. A one-piece drive attachment for a J-hook, said attachment including an open-ended sleeve of rectangular inside transverse cross-sectional shape, said sleeve being defined by a pair of laterally spaced apart, registered and parallel opposite side plate portions including two pairs of corresponding opposite side marginal edges and a pair of elongated, parallel spacer portions each disposed between, extending along and rigidly interconnecting a corresponding pair of said side marginal edges, said sleeve defining a major inside transverse dimension between said spacer portions and a minor transverse dimension between said plate portions, an elongated drive shank of a diameter substantially equal to said minor transverse inside dimension, one end of said drive shank being telescoped within one end of said sleeve between said plate portions and positioned against and paralleling the inner surface of one of said spacer portions, said drive shank being rigidly secured to said sleeve, the other end of said drive shank projecting endwise outwardly from said one end of said sleeve, said one end of said drive shank terminating inwardly of said one end of said sleeve a spaced distance outwardly of the longitudinal mid-point of said sleeve, the free end of said other end of said shank including means adapted to have a rotary torque input tool removably coupled thereto, the other end of said sleeve being adapted to have the hooked end of a threaded shank-equipped J-hook slidingly telescoped therein, the end of one of said plate portions remote from said one end of said sleeve terminating appreciably inwardly of the corresponding end of the other plate portion, whereby an appreciable end portion of the inner surface of said other plate portion is exposed from the side of said sleeve partially closed by said one plate portion and may be used as a guide surface for assisting the manual insertion of the hooked end of a J-hook into said other end of said sleeve, said other plate portion having a central opening formed therethrough registered with a central portion of said end of said one plate portion remote from said one end of said sleeve, said opening and central portion being engageable between the thumb and forefinger of the user's hand to withdraw said sleeve from the hooked end of an installed J-hook, said one end of said drive shank comprising an abutment limiting telescoped engagement of the hooked end of a J-hook into said sleeve from said other end thereof, said one end of said drive shank terminating inwardly a spaced distance outward of said opening toward said one end of said sleeve.

4,509,394

RADIATOR FILLER NECK REFACING TOOL

Dan Medlock, 1209 E. Main St., Richmond, Ky. 40475

Filed Apr. 20, 1983, Ser. No. 486,734
Int. Cl.³ B23B *5/00*
U.S. Cl. 82—4 R 1 Claim



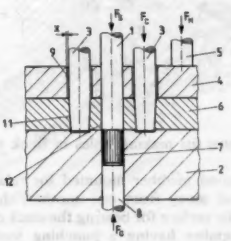
1. A radiator filler neck refacing tool, comprising, in combination, a flat, circular main body, a guide sleeve fitted through a central opening in said main body, a flange around an intermediate portion of said sleeve being shouldered against an upper side of said main body, a hexagonal head formed around an upper end of said sleeve, a threaded central opening extending axially through said sleeve, a cutting depth control bolt engaged in an upper portion of said threaded opening for elevating or lowering said tool on said neck, a lower portion of said threaded opening being engagable by a stud mounted on a radiator filler neck for securing said tool upon said neck, a plurality of radially extending cutting members mounted on an underside of said main body for placement upon the face of a top end of said radiator filler neck, and wrench-engaging means upon an upper side of said main body for turning said tool, and causing cutting edges of said cutting members to reface said top end face.

4,509,395

PROCESS FOR PRECISION CUTTING

Johannes Haack, Lyss, Switzerland, assignor to Feintool AG Lyss, Lyss, Switzerland

Filed Jul. 1, 1981, Ser. No. 279,560
Claims priority, application European Pat. Off., Jul. 8, 1980, 80200663.5
Int. Cl.³ B26D *3/00*
U.S. Cl. 83—55 23 Claims



1. A process for precision cutting a hole in a workpiece which is less than 30 mm thick in the direction of the cut where the hole comes within 30 mm of an edge of the workpiece, said process comprising the steps of:

(a) clamping a workpiece (6) the thickness S of which is less than 30 mm and which is unheated between a smooth surfaced cutting plate (2) having a bore therein for the receipt of a waste slug (7) located underneath the hole to be cut and a smooth surfaced retaining member (4), both said cutting plate (2) and said retaining member (4) lacking a knife edge ring surrounding the hole to be cut;

(b) prior to undertaking a cutting operation, supporting the workpiece (6) laterally adjacent the hole to be cut therein at a point where the distance A between the nearest edge of the hole to be cut and an edge of the workpiece is both less than 30 mm and less than the thickness S of the workpiece (6) with at least one supporting member (3);

(c) prior to undertaking a cutting operation, supporting the workpiece (6) beneath the hole to be cut with pressure pad (8) movably mounted in said bore; and

(d) cutting a hole in the workpiece (6) with a cutting punch (1) which is movable independently of said at least one supporting member (3), said cutting punch (1) cutting out a waste slug (7) which it ejects into said bore against a counterforce supplied by said pressure pad (8), said pressure pad (8) yielding before forward movement of said cutting punch (1), thereby leaving a precision-cut hole in the workpiece (6) which is spaced laterally from said at least one supporting member (3) by a distance A which is both less than 30 mm and less than the thickness S of the workpiece (6).

4,509,396

APPARATUS FOR MAKING HOLES IN THICK STACKS OF PAPER

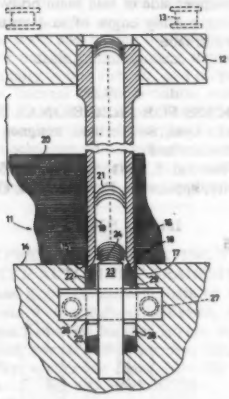
Walter Schall; Guido Negro, both of Neuffen; Martin Hipp, Grossengstingen, and Hans Albrecht, Neuffen, all of Fed. Rep. of Germany, assignors to Bielomatik Leuze GmbH & Co., Fed. Rep. of Germany

Filed Apr. 29, 1983, Ser. No. 490,194

Claims priority, application Fed. Rep. of Germany, May 29, 1982, 3220461

Int. Cl.³ B26F *1/14*

U.S. Cl. 83—126 **7 Claims**



1. An appratus for making holes in thick stacks of paper, comprising:

first and second member mounted for relative movement toward and away from one another, the first member having a die surface for bearing the stack of paper and the second member having a punching tool non-rotatably fixed thereto, the punching tool having an inner bore and a sharp axially pointing cutting edge at its end, the bore communicating with a first discharge opening for cut-out cup-shaped waste parts which collect in the bore;

the die surface having an opening forming a cutting rim at the die surface;

a counterpunch having a diameter corresponding to the bore in the punching tool and disposed in the opening to form an annular gap between the cutting rim and the counterpunch; and,

an annular removal path for cut-out annular waste parts which collect in the gap, the removal path communicating between the gap and a second discharge opening remote from the die surface, the removal path including means for retarding movement of the annular waste parts along the removal path, so as to form a self-renewing countercutting plug cooperating with the cutting edge of the tool, whereby, when said members undergo movement toward one another, the stack is first cut by the cutting edge of the punching tool alone, the cup-shaped waste parts being transported through the bore in the punching tool to the first discharge opening, and when cutting has progressed through the stack, the paper is punched out between the rim of the die opening and the counterpunch to form both waste parts, the cup-shaped waste parts being transported through the bore, and the annular waste parts being retardedly transported through the removal path.

4,509,397

PUNCH AND PERFORATION JIG ASSEMBLY HAVING POSITION MAINTAINING FEATURE

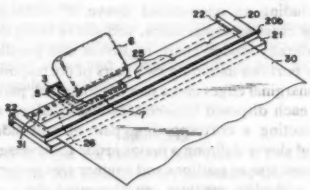
Chuzo Mori, Funabashi; Jun Watanabe, Matsudo, and Katsutaka Kudo, Tsuchiura, all of Japan, assignors to Carl Manufacturing Co., Ltd., Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,488

Claims priority, application Japan, Sep. 27, 1982, 57-145873[U]; May 30, 1983, 58-81502[U]; May 30, 1983, 58-81500[U]

Int. Cl.³ B26D *1/14*

U.S. Cl. 83—453 **22 Claims**



1. A perforator which comprises:

a punch provided in a front portion thereof with at least one projection and possessing a recess extended under said projections from the front side toward the rear side thereof and adapted to receive insertion of paper sheets, and

a separate perforation jig comprising upper and lower sheet retainer members, a front longitudinal edge of said upper sheet retainer member being pivotally attached to a front longitudinal edge of said lower sheet retainer member, said upper sheet retainer member being provided along the pivotally attached edge thereof with at least one punch-positioning depression adapted to engage with the projections of said punch, said perforating jig being provided with a protruding punch-supporting member on the side containing said punch-positioning depressions and adapted to enter said recess of said punch when the front portion of said punch is abutted against said upper sheet retainer member.

4,509,398

BLOCK GUIDE CUTTER

Preston A. Mason, 903 44th St., Oakland, Calif. 94608

Filed Feb. 21, 1984, Ser. No. 581,995

Int. Cl.³ B27B *9/04*

U.S. Cl. 83—745 **3 Claims**

1. A block cutting tool comprising a flat, rectangular plate having an upper face and a lower face;

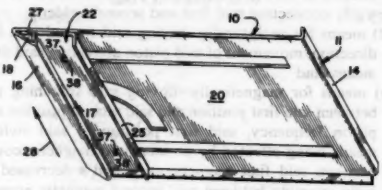
a saw guide extending from an edge of said plate above and in a plane perpendicular to said upper face;

a work-engaging means extending from the lower face of

said plate parallel to and at a fixed distance from said saw guide;

a second engaging means extending from the lower face of said plate, said second work-extending means lying in a plane perpendicular to the plane of said saw guide;

an adapter including third work-engaging means; and



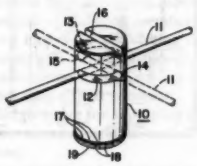
releasable means to hold said adapter with said third work-engaging means parallel to said saw guide, at a fixed predetermined distance from said saw guide, and with said third work-engaging means positioned between said saw guide and said work-engaging means.

4,509,399

VIBRATION DAMPER FOR STRING MUSICAL INSTRUMENT

Jerry McKibben, Seneca, S.C., assignor to Coats & Clark, Inc., Seneca, S.C.

Filed Mar. 1, 1983, Ser. No. 470,998
Int. Cl.³ G10C *3/00*
U.S. Cl. 84—216 **6 Claims**



1. A vibration damper for a musical instrument having a vibratory string with a given diameter, comprising:

a cylindrical body comprising a yieldable material,

one end of said body having means for receiving a tool to rotate said body about the longitudinal axis thereof,

said body having a pair of substantially coplanar oppositely disposed slits in the surface thereof, each slit having a width less than the diameter of a string to be secured therein, each slit subtending a radial angle greater than 90 degrees, said slits communicating with each other through a cavity in said body capable of receiving said string,

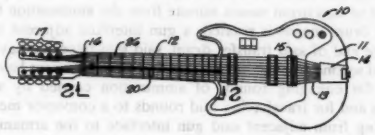
one end of each slit being enlarged to a diameter greater than the diameter of said string to be secured, the enlarged ends of said slits being disposed 180 degrees apart, whereby said string may be inserted through said enlarged ends of said slits and said cavity, and thereafter said body may be rotated by engagement of a tool with said one end thereof, to cause said string to yieldably deform said body adjacent the edges of said slits, so that said string is secured to said body.

4,509,400

SLIDE BAR GUITAR

Walter E. Smith, Box 707, Weiser, Id. 83672

Filed Jun. 10, 1983, Ser. No. 503,260
Int. Cl.³ G10D *3/06*
U.S. Cl. 84—293 **1 Claim**



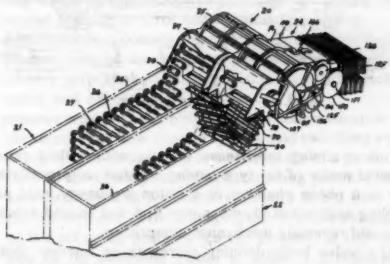
1. In a stringed musical instrument having a set of tensioned strings occupying a common plane overlying the instrument and adapted to be played in conjunction with a manually-held slide bar, a position indicator comprising: a carrier extending longitudinally of the tensioned strings and having a series of longitudinally spaced projections extending above said common plane and between the same two strings, each projection forming a pair of opposed longitudinally spaced abutments engageable by said slide bar during longitudinal movement thereof, such movement serving to place the slide bar in preselected locations with respect to said strings, certain of the strings on one side of the position indicator being tuned to produce a first major chord when sounded together, and certain of the strings on the other side of the position indicator being tuned to produce a second major chord when sounded together, resilient means yieldably supporting the carrier and projections to enable the slide bar to depress the projections in sequence to an inoperative position against the action of said resilient means.

4,509,401

PORTABLE AMMUNITION HANDLING AND LOADING SYSTEM

Stephen F. Pollock, Tallahassee, Fla., assignor to Wayne H. Coloney Company, Inc., Tallahassee, Fla.

Continuation of Ser. No. 563,885, Dec. 28, 1983, abandoned, which is a continuation of Ser. No. 376,044, May 7, 1982, abandoned. This application Jun. 27, 1984, Ser. No. 624,807
Int. Cl.³ F42B *39/12*
U.S. Cl. 86—48 **12 Claims**



1. An apparatus for transferring large caliber ammunition stored in tubular members of an ammunition belt from a supply container to an armament system and simultaneously delivering shells and unfired rounds of ammunition from the armament system to a collection container comprising a housing, means for mounting said housing on the supply and collection containers, a drum means rotatably mounted within said housing, a plurality of fixed and radially spaced cradle members carried by said drum means adjacent one end thereof, a supply interface having conveying means to draw the ammunition belt from the supply container and guide the tubular members of the ammunition belt toward said fixed cradle members of said

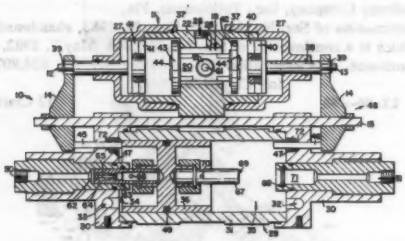
drum, a plurality of shuttle means carried by said drum means and being longitudinally movable relative thereto between said fixed cradle members and the opposite end of said drum means, each of said shuttle means having ammunition engaging and support means so that said shuttle means can engage a round of ammunition carried within the tubular members of the ammunition belt and transfer the same therefrom towards said opposite end of said drum means remote from the ammunition belt as said drum means is rotated, a gun interface adjacent said opposite end of said transfer drum, said gun interface having first and second transfer means, said first transfer means having means for engaging rounds of ammunition carried by said shuttles and for transferring said rounds to a conveyor means extending from adjacent said gun interface to the armament system, said second transfer means being vertically spaced from said first transfer means and having means for receiving shells and unfired rounds of ammunition passing from the armament system through the conveyor means and transferring such shells and unfired rounds to said shuttle means, a discharge interface remote from said gun interface and in vertically spaced relationship to said supply interface, a reorientation chute means extending from adjacent said discharge interface outwardly of said housing and longitudinally of said drum means, said discharge interface having means to guide the ammunition belt from said drum means into said reorientation chute means so that the ammunition belt is shifted longitudinally with respect to said drum means outwardly of said housing and guide means for guiding said ammunition belt from said reorientation chute means into the collection container.

4,509,402

MAGNETIC REVERSING MECHANISM

Duane L. Salmonson, Cottage Grove, Minn., assignor to Economics Laboratory, Inc., St. Paul, Minn.

Filed Jun. 8, 1983, Ser. No. 502,251
Int. Cl.³ F01L *25/08, 23/00*
U.S. Cl. 91—275 19 Claims



1. A reversing mechanism for use with a fluid pressure actuated motor of the type having a piston reciprocally movable in a piston chamber at a piston frequency, said piston dividing said piston chamber into first and second subchambers, said reversing mechanism comprising:

(a) a valve body defining therewith an interior chamber having an inlet port, outlet port, and first and second transfer ports, said inlet port adapted to receive a flow of pressurized fluid, said interior chamber having a first opening at a first end and a second opening at a second end;

(b) means for switching the flow of pressurized fluid from said inlet port between said first and second transfer ports, said switching means having a first magnetic area and a second magnetic area wherein when said switching means is in a first position the pressurized fluid flows to said first transfer port and when said switching means is in a second position the pressurized fluid flows to said second transfer port, said switching means positioned within said interior chamber between said first and second ends of said interior chamber;

(c) a tie rod assembly having first and second magnetic holders, said first holder positioned in said first opening of said interior chamber and said second holder positioned in said second opening of said interior chamber, said holders slidable in said interior chamber, and a tie rod cooperatively connecting said first and second holders;

(d) means for reciprocally driving said tie rod in a lateral direction, movement of said piston activating said driving means; and

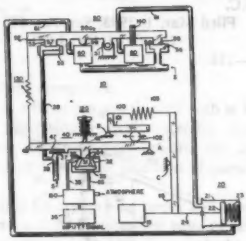
(e) means for magnetically moving said switching means between said first position and said second position at said piston frequency, said first position of said switching means being effected by an increased magnetic coupling between said first magnetic areas and a decreased magnetic coupling between said second magnetic areas, and said second position of said switching means being effected by an increased magnetic coupling between said second magnetic areas and a decreased magnetic coupling between said first magnetic areas.

4,509,403

POSITIONER HAVING USER-ADJUSTABLE DYNAMIC RESPONSE

George W. Gassman, and Gerald F. Varnum, both of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Marshalltown, Iowa

Filed Apr. 23, 1982, Ser. No. 371,331
Int. Cl.³ F15B *13/16*
U.S. Cl. 91—365 12 Claims



1. A positioner system for controlling the position of a controlled device in accordance with an input signal comprising:

output means for controlling the position of said controlled device;

summing means for integrating said input signal with a signal representative of the position of said controlled device and for producing a command signal for said output means;

adjustable damping means including user-adjustable variable rate spring means for tailoring the dynamic overshoot characteristic of said system to accommodate a wide range of controlled devices;

said variable rate spring means affecting said overshoot characteristic without substantially affecting static characteristics of said system;

said variable rate spring means comprising a pair of spring members, each having one end coupled to a respective one of said output means and said summing means; and

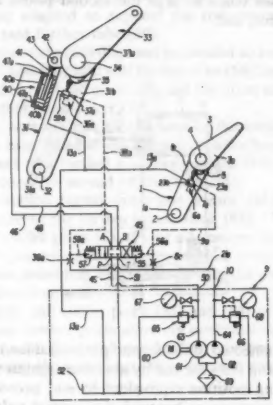
a movable clamp for simultaneously changing the effective lengths of said spring members to alter the damping effect on said summing means.

4,509,404

MASTER/SLAVE FLUID PRESSURE APPARATUS

Masakatsu Kawahara, Amagasaki, and Masaru Takeda, Kobe, both of Japan, assignors to Kobe Steel, Limited, Kobe, Japan

Continuation of Ser. No. 214,679, Dec. 9, 1980, abandoned. This application Aug. 22, 1983, Ser. No. 525,427
Claims priority, application Japan, Dec. 14, 1979, 54-162985
Int. Cl.[3] F15B *13/16*
U.S. Cl. 91—388 1 Claim



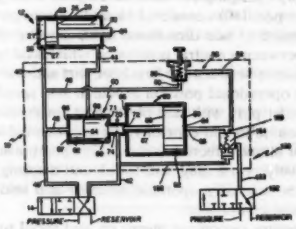
1. A master/slave fluid-pressure apparatus comprising:
a first and second shaft;
a master member pivotably mounted on said first shaft and having a first cam member extending therefrom;
a slave member pivotably mounted on said second shaft and having a second cam member and a lobe member, each extending from one end of said slave member;
a fluid-pressure actuator operatively connected to said slave member and which includes means for moving said slave member wherein said means for moving said slave member is connected to said lobe member;
a first hydraulic means for converting displacement of said master member into a fluid pressure;
second hydraulic means for converting displacement of said slave member into a fluid pressure;
a source of fluid pressure for supplying fluid pressure to said fluid-pressure actuator and to said first and second hydraulic means;
a three-position directional valve connected to said fluid-pressure actuator and said fluid pressure supply and having first and second pilot chambers connected to said first and second hydraulic means, respectively, for receiving fluid pressure therefrom, said three-position directional valve being controllable by comparison between the fluid pressure applied to said pilot chambers from said first and second hydraulic means for controlling follow-up movement of said slave member with respect to said master member wherein each said first and second hydraulic means further comprises a restrictor in communication with said fluid pressure source and a relief valve; wherein each said relief valve further comprises a poppet, a roller contacting one of said first and second cams, a roller rod connected to said roller and a coil spring disposed between said roller rod and said poppet; and each said relief valve of said first and second hydraulic means is connected via one of said restrictors to said fluid pressure source; and wherein each said first and second hydraulic means further comprises a first fluid line extending between one of said relief valves and one of said restrictors, and a second fluid line connected between said first fluid line and one of said pilot chambers, whereby said first and second fluid lines of each of said first and second hydraulic means comprise means for applying fluid pressures to said first and second pilot chambers, respectively, so that the fluid pressures in said first fluid lines can be controlled in response to the displacement of said master and slave members.

4,509,405

CONTROL VALVE SYSTEM FOR BLOWOUT PREVENTERS

H. John Bates, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 067,609, Aug. 20, 1979, Pat. No. 4,349,041. This application Jan. 11, 1982, Ser. No. 338,792
The portion of the term of this patent subsequent to Nov. 14, 1999, has been disclaimed.
Int. Cl.[3] F15B *13/04;* F16K *31/122*
U.S. Cl. 91—420 5 Claims



1. For use with a blowout preventer having an actuating cylinder and piston for actuating the closing of the blowout preventer, the actuating piston having a closing side and an opening side of smaller effective area than the closing side, a differential pressure control valve system comprising:
a directional flow control system for directing flow from the opening side of the actuating piston alternatively to the closing side of the actuating piston and to a discharge point; and
a pressure sensitive switching system in communication with the directional flow control system, said switching system being operative, upon the communication of a pressurized fluid to the closing side of said actuating piston, to cause said directional flow control system to direct flow from the opening side of the actuating piston to the closing side of the actuating piston when the pressure at the closing side of the actuating piston is below a predetermined magnitude, and to automatically vary the alternative flow paths of the directional flow control system when the pressure at the closing side of the actuating piston reaches said predetermined magnitude to cause said directional flow control system to direct flow from the opening side of the actuating piston to said discharge point;
said pressure sensitive switching system further comprising an override system for selectively causing said directional flow control system to direct flow from the opening side of the actuating piston to the discharge point independently of the pressure at the closing side of the actuating piston.

4,509,406

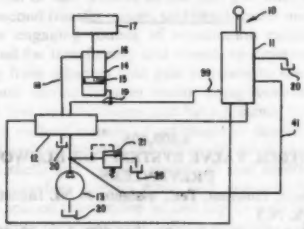
PRESSURE REDUCING VALVE FOR DEAD ENGINE LOWERING

Kurt B. Melocik, Mazon, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 230,972, Jun. 16, 1980, abandoned. This application Mar. 16, 1983, Ser. No. 475,872

Int. Cl.³ F15B *11/08, 13/042*

U.S. Cl. 91—453 **10 Claims**



1. In a fluid system (10) having a reciprocable fluid motor (14), fluid supply means including a source of pressurized fluid (13), a pilot operated directional control valve (12) for controlling delivery of the pressurized fluid to said fluid motor for reciprocably operating the same, and a pilot valve (11) having a first inlet port (40) connected to said source, an outlet port (35) connected to said directional control valve, a spool (31) movable between a neutral position at which said spool blocks communication between the first inlet port and said outlet port and a first operational position at which said spool communicates the inlet port with said outlet port for conducting fluid from the source to said control valve to controllably move the fluid motor in one direction, a manually operable actuator (22) for selectively positioning said spool, and a spring positioned between the manually operable actuator and said spool, the improvement comprising:

fluid pressure responsive means on said spool to move said spool for providing pressure regulation of the fluid in the outlet port at the first operational position of the spool;

means in said pilot valve defining a second inlet port (100) connected to a load supporting end of said fluid motor; and

said manually operable actuator and said fluid pressure responsive means defining means for causing said spool to move to a second operational position at which the spool communicates the second inlet port with the outlet port for conducting fluid from the load supporting end of said fluid motor to the control valve at the regulated pressure only in the absence of pressurized fluid from said source in said first inlet port.

4,509,407

HYDRAULIC CONTROL VALVE WITH MAINTENANCE-FACILITATING FEATURE

Spyros Balaskas, Bremen, Fed. Rep. of Germany, assignor to Vereinigte Flugtechnische Werke GmbH, Bremen, Fed. Rep. of Germany

Filed Jun. 6, 1983, Ser. No. 501,414

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1952, 3222435

Int. Cl.³ F15B *13/042, 15/26*

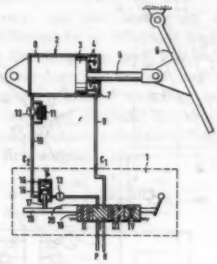
U.S. Cl. 91—466 **2 Claims**

1. A system including a valve and a hydraulic actuator, the valve including a valve slide element adjustable to assume different operating positions to, thereby, establish different hydraulic operating states for the actuator, the actuator having a chamber with a piston movable therein, there being a first and a second conduit for connecting the valve to the chamber, respectively, on opposite sides of the piston, the improvement comprising:

the valve slide element having in addition a venting position for the actuator for opening conduction into the first conduit, but not into the second conduit;

a slide rod connected to the valve slide and being provided with a step;

a spring-loaded second piston and a second chamber, the chamber being inserted in one of said conduits between the control valve and the actuator such that pressure in the conduit tends to urge the second piston against the spring force; and



a plunger connected to the second piston and having a disposition to stop the slide rod by abutment against said step in the venting position equivalent to and providing for a venting operation as between the control valve and the actuator if substantial air bubbles are contained in the system, so that system pressure is insufficient to retract the second piston and its plunger, full operating pressure in said one conduit being effective to retract said second piston with the plunger for unrestraint positioning of the slide element through its rod in any of the operating positions.

4,509,408

FLUID PRESSURE ACTUATOR

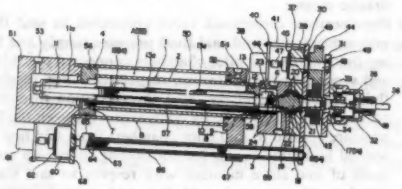
Takeshi Kuroda, Kure, Japan, assignor to Kowa Shoji, Ltd., Tokyo, Japan

Filed Apr. 20, 1983, Ser. No. 486,772

Claims priority, application Japan, Apr. 20, 1982, 57-66527

Int. Cl.³ F01B *21/00*

U.S. Cl. 92—2 **4 Claims**



1. A fluid pressure actuator comprising, a cylinder body (1) a telescopic rod (10) disposed in a cylinder tube (2) of the body (1):

a piston (9) disposed in the tube (2) and secured to one end of the rod (10);

a screw shaft (14) disposed in and extending through the rod (10) and having a helically grooved portion (15), a support portion (16) and an output portion (17);

a final output shaft (36) and rotation signal generator means (38) both connected to the output portion (17);

a ball nut (23) having balls (24), said balls engaging with a

helical groove of the grooved portion (15) and said ball nut secured to the piston (9);

a rod cover (4) secured to the other end of the telescopic rod (10) and also to one end of the cylinder tube (2);

a head cover (3) secured to the other end of the tube (2) and supporting the support portion (16);

a pipe (57) extending between the head cover (3) and the rod cover (4) and passing through the piston (9);

a further cylinder tube (50) coaxial with and enclosing the tube (2), the further tube (50) having a further head cover (51) and adapted to support the rod cover (4) slidable within said further tube (50);

a still further tube (66) disposed in parallel to and outside the further tube (50), and still further tube (66) having one end secured to the head cover (3), and the other end secured to the further head cover (51);

a further screw shaft (63) rotatably disposed in the still further tube (66) and engaging with a further ball nut (65) by means of a further plurality of balls (64), the ball nut (65) secured to an end of said tube (66);

further rotation signal generator means (61) operatively connected to the further screw shaft (63);

inlet and outlet ports (6), (7), of a pressure fluid said ports allowing communication between said pressure fluid and said tube providing means for driving the piston (9) in an axial direction; and

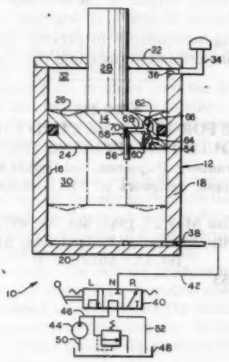
further inlet and outlet ports (53) and (54) of the pressure fluid said further ports allowing communication between said pressure fluid and said further tube providing means for driving the rod cover (4) in an axial direction.

4,509,409

PUMP ARRANGEMENT FOR A LINEAR FLUID OPERATED DEVICE

Jerry L. Reeves, Dallas, Oreg., assignor to Towmotor Corporation, Mentor, Ohio

Filed Feb. 7, 1983, Ser. No. 464,243
Int. Cl.³ F15B *21/04*
U.S. Cl. 92—80 **2 Claims**



1. A linear fluid operated jack; comprising:

a housing having first and second end members and a bore extending between said end members;

a reciprocating piston having an aperture, and being slidably disposed in said bore and movable between said end members, said housing defining first and second chambers separated by said reciprocating piston, said second chamber being vented to the atmosphere;

a pumping assembly having a pump piston, a pump body having a pump chamber, and first and second fluid passages, said pumping assembly being disposed in said aperture, said first fluid passage connecting said first chamber to said pump chamber, and said second fluid passage connecting said second chamber to said pump chamber, said pump piston being slidably disposed in said pump chamber and movable in a first direction toward said pump chamber and in a second direction opposite said first direction, said pump piston being adapted to force fluid from said pump chamber in response to movement in said first direction and draw fluid into said pump chamber in response to movement in said second direction, said pump piston having a pumping end disposed in said pump chamber and a force responsive end exposed to said first chamber, said first passage having a first aperture and a first increased diameter portion and being disposed in said pump piston, said first increased diameter portion being open to said first chamber and said first aperture, and said first aperture being open to said pump chamber;

means for fastening said pump body to said reciprocating piston;

first means for passing fluid flow, in said first passage, from said pump chamber to said first chamber, and blocking fluid flow, in said first passage, from said first chamber to said pump chamber, said first means having a first seat surface disposed in the pump piston and connecting the first aperture to said first increased diameter portion, and a first check disposed in the first increased diameter portion of said first passage and engageable with the first seat surface;

second means for passing fluid flow, in said second passage, from said second chamber to said pump chamber, and blocking fluid flow, in said second passage from said pump chamber to said second chamber, said first and second means for passing being connected to said pumping assembly;

means for biasing said pump piston in said second direction; and

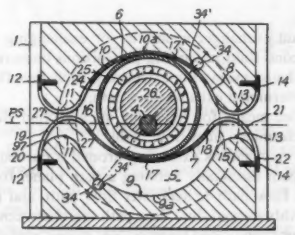
means for applying a force to said pump piston and moving said pump piston in said first direction against said biasing means, said pump piston being movable in said first direction in response to said force being at or greater than a preselected minimum magnitude.

4,509,410

VARIABLE VOLUME FLUID INDUCTION AND DELIVERY MACHINE

Jean H. P. Blin, 6, Square Henry PatéParis, France

Filed Feb. 10, 1983, Ser. No. 465,671
Claims priority, application France, Feb. 16, 1982, 82 02506
Int. Cl.³ F01B *17/00*
U.S. Cl. 92—89 **18 Claims**



1. A variable volume induction and delivery machine having a longitudinal direction and a transverse direction, said machine comprising:

a fixed curved wall having transverse edges and longitudinal edges,

a wall movable with respect to said fixed wall and situated in facing relation thereto and having transverse edges and longitudinal edges,

control means for moving said movable wall closer to or away from said fixed wall,

two fixed flat, parallel side walls perpendicular both to the fixed wall and to the movable wall, and tightly engaging the transverse edges of said fixed wall and said movable wall, said four walls defining a chamber of variable volume,

an induction pipe provided with a suction valve and connected to said variable volume chamber,

a delivery pipe provided with a delivery valve and connected to said variable volume chamber,

the longitudinal edges of the movable wall being secured in a tight manner to the corresponding longitudinal edges of the fixed wall, and

the movable wall comprising

a rigid middle part which extends over its length between its transverse edges, and

two longitudinally extending side parts disposed on either side of the rigid middle part, and said side parts being flexible in the transverse direction and rigid in the longitudinal direction.

4,509,411

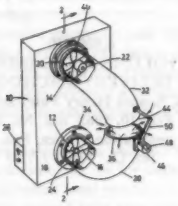
FLUID HANDLING DEVICE

Edward T. Martin, Georgetown, Canada, assignor to Axis Products Limited, Georgetown, Canada

Filed Dec. 21, 1982, Ser. No. 451,852

Int. Cl.³ F24F *7/08*

U.S. Cl. 98—34.5 **7 Claims**



1. A fluid exchanger apparatus for exchanging a first fluid with a second fluid in varying proportions comprising;

fluid exhaust means for exhausting such first fluid along a predetermined exhaust flow path;

fluid inlet means for inducting such second fluid along a predetermined inlet flow path;

transfer duct means extending around a curved flow path, said path essentially defining a path plane, from said exhaust flow path to said inlet flow path, and providing a smoothly curved fluid flow path therebetween, a movable duct portion of said transfer duct means, said duct portion being movable relative to the fluid exhaust means and to said fluid inlet means, between a transfer position in which fluid transfer takes place from said fluid exhaust means to said fluid inlet means, and a disconnect position in which fluid is exhausted by said exhaust and fluid is taken in by said inlet independently of each other, and,

duct movement means for moving said movable portion between said positions and into a plurality of different locations intermediate said positions, whereby said first fluid may be mixed with said second fluid in varying proportions.

4,509,412

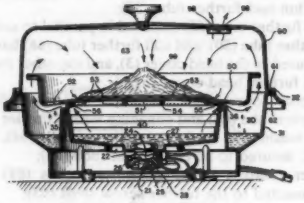
FOOD STEAMING DEVICE

Stephen L. Whittenburg, Overland Park, Kans.; David D. McCormick; William J. Tweed, both of Kansas City, Mo.; A. Aykut Ozgunay, Clinton, Mo., and James T. Williams, Sacramento, Calif., assignors to Rival Manufacturing Company, Kansas City, Mo.

Filed Mar. 4, 1983, Ser. No. 472,193

Int. Cl.³ A47J *27/04*

U.S. Cl. 99—331 **32 Claims**



1. A steam cooking utensil comprising:

a base;

a boiling water reservoir defined by the base;

a heater, mounted in the base to heat liquid in the boiling water reservoir;

thermostat means, mounted in the base and coupled to the heater, for switching off the heater when all the liquid in the boiling water reservoir has evaporated therefrom;

a condensate trough, defined by the base and thermally insulted from the heater; and

a food tray comprising an imperforate surface and a drainage surface, said food tray supported above the reservoir and trough such that said imperforate surface is aligned with the boiling water reservoir, said drainage surface is aligned with the condensate trough, and water flows from the imperforate surface to the drainage surface and into the condensate trough, said reservoir, trough and tray cooperating substantially to prevent the flow of water from the imperforate surface into the reservoir.

4,509,413

PROCEDURE FOR TREATING CURD PARTICLES AND CHEESE MOULD FOR APPLYING THE PROCEDURE

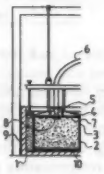
Carl-Gustav Granberg, Paippinen, and Heikki Kauppi, Helsinki, both of Finland, assignors to MKT-tehtaat Oy, Helsinki, Finland

Filed May 27, 1983, Ser. No. 497,169

Claims priority, application Finland, May 31, 1982, 821909

Int. Cl.³ A01J *25/00*

U.S. Cl. 99—453 **4 Claims**



1. An apparatus for treating a mixture of whey and curd particles obtained from the cooking step in a cheese-making process, said apparatus comprising a vat, at least one cheese mould positioned within said vat, said at least one cheese

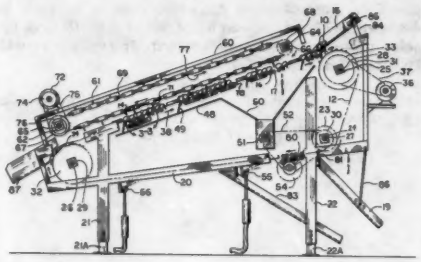
mould having a bottom part and side wall parts extending upwardly from said bottom part, said bottom part and said side wall parts are made of a strainer sheet capable of draining whey from the interior of said cheese mold, a separate strainer-like cover part positionable within said side wall parts and being vertically movable relative to said bottom part and side wall parts, said cover part having an opening for supplying whey and curd particles into said cheese mould, a supply conduit connected to said opening in said cover part for filling whey and curd particles into said cheese mould while said cheese mould is closed by said cover part.

4,509,414

STEMMING AND PEELING APPARATUS

Tony T. Chiu; Charles W. Coatney, both of Los Gatos, and Katsuji Hirahara, Santa Clara, all of Calif., assignors to Magnuson Corporation, Reno, Nev.

Filed Aug. 26, 1983, Ser. No. 526,606
Int. Cl.³ A23N *7/00, 7/02*
U.S. Cl. 99—585 **8 Claims**



1. An apparatus for stemming and peeling produce, comprising:

a first conveyor having an inclined section and carrying a plurality of parallel-positioned pinch rolls extending normal to the direction of travel of the conveyor;

means to drive said first conveyor;

first rotating means rotating adjacent pinch rolls on said first conveyor in opposite directions;

a chute for feeding the produce onto the first conveyor at one end of said inclined section to allow the produce to ride on the first conveyor throughout that section and be exposed to the pulling action of said opposite rotating pinch rolls;

means to control the rate at which the produce moves across the inclined section thereby to regulate the dwell time the produce spends on the pinch rolls and the density of the product to assure removal of a predetermined percentage of appendages from the produce; and

said means to control the rate the produce moves across the inclined section comprising a second conveyor carrying plows positioned to move along the inclined section in a direction opposite to the direction the first conveyor is moving to control the rate the produce moves across the inclined section.

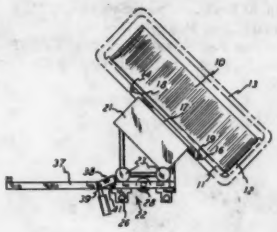
4,509,415

METHOD AND APPARATUS FOR SUPPLYING STRAP TO AN ITEM

Walter J. Stobb, Pittstown, N.J., assignor to Stobb, Inc., Clinton, N.J.

Filed Oct. 17, 1983, Ser. No. 542,650
Int. Cl.³ B65B *13/04*
U.S. Cl. 100—2 **18 Claims**

1. A method for supplying strap to encircle an item positioned on a strapper, comprising the steps of positioning an item on a strapper having only a segment of a strap guide disposed on a plane in a fixed position and with the item being positioned on said plane to be strapped therealong, movably supporting two strapping mechanisms adjacent said segment and with each of said mechanisms having a strap guide segment matable with the first said segment, and selectively positioning either one of said two strapping mechanisms into mating relationship with the first said segment for strapping the item.

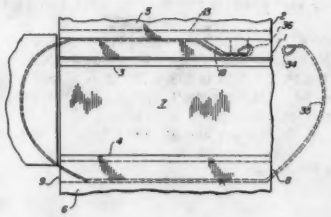


4,509,416

BALE TIE JOINING DEVICES

Emil Simich, Chicago, Ill., assignor to A.J. Gerrard & Company, Des Plaines, Ill.

Filed Jul. 7, 1983, Ser. No. 511,649
Int. Cl.³ B65B *13/06*
U.S. Cl. 100—25 **9 Claims**



1. A bale tie joining device comprising

a. a housing having a pair of upstanding sidewalls spaced apart for defining an elongated passageway extending therethrough for the longitudinal passage of an elongated bale tie through said passageway from one end to the other end thereof,

b. an anchor member positioned in said housing within said elongated passageway in spaced relation to said one end of said housing for engaging and holding the trailing end loop portion of such a bale tie during such passage of the latter through said passageway in position to be joiningly engaged by the other end portion of said bale tie, and

c. said housing having an opening in the top thereof, between said anchor member and said one end of said passageway, for viewing the joined and engaged tie ends in said passageway from outside said housing when said engaged and joined tie ends have been released from said anchor member.

4,509,417

APPARATUS FOR EXPELLING AIR FROM STACKS OF PAPER SHEETS OR THE LIKE

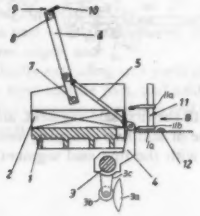
Eckhard Brandt, Norderstedt, and Wolfram Wolf, Bilsen, both of Fed. Rep. of Germany, assignors to E.C.H. Will (GmbH & Co.), Hamburg, Fed. Rep. of Germany

Filed Feb. 2, 1984, Ser. No. 576,205

Claims priority, application Fed. Rep. of Germany, Feb. 12, 1983, 3304955

Int. Cl.³ B30B 9/00

U.S. Cl. 100—90 14 Claims



1. Apparatus for manipulating stacks of superimposed sheets of paper or the like wherein pockets of entrapped air are likely to develop between neighboring sheets, comprising a support for the lowermost sheet of each of a series of successive stacks; means for transporting successive stacks of the series away from said support in a predetermined direction; and means for expelling air from between the sheets of successively transported stacks, including a pressure applying device and means for moving said device into engagement with the topmost sheet of the stack on said support so that said device exerts upon the topmost sheet a requisite pressure at least substantially all the way across the stack, as considered transversely of said direction, while the stack is being transported away from said support whereby the topmost layer moves with reference to said pressure applying device.

4,509,418

SURFACE FOR SUPPORTING CUT FRUIT IN FRUIT JUICER

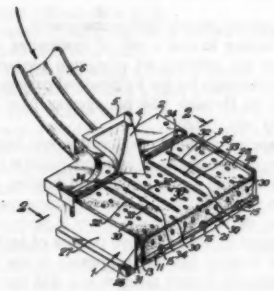
Stewart C. Nelson, Forest Hills, N.Y., assignor to The Automatic Orange Juicer Corp., Forest Hills, N.Y.

PCT No. PCT/US83/00578, § 371 Date Mar. 29, 1984, § 102(e) Date Mar. 29, 1984, PCT Pub. No. WO84/04025, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 18, 1983, Ser. No. 606,434

Int. Cl.³ A23N 1/00

U.S. Cl. 100—97 7 Claims



1. In a citrus fruit juice extractor having means for feeding whole citrus fruit to the extractor, means for cutting the fruit, means for feeding the cut fruit to a supporting surface, means above and below the support surface for expressing the juice from the cut fruit, and means for collecting the juice expressed from the fruit, the improvement comprising:

a. means for collecting the juice expressed from the fruit comprising a juice collector tray having a bottom, side support walls parallel to said means for cutting said fruit and front and rear walls perpendicular to said means for cutting said fruit;

b. an elastic sheet member for supporting said cut fruit during expressing of the juice from said cut fruit, said elastic sheet member being supported by said front and rear walls of said juice collecting means and being held in place on the outer portions of said front and rear walls, the opening between said elastic sheet member and said juice collecting means being remote from the location of feeding of said cut fruit onto said elastic sheet member.

4,509,419

WORM PRESS FOR MECHANICALLY SEPARATING LIQUID/SOLID MIXTURES

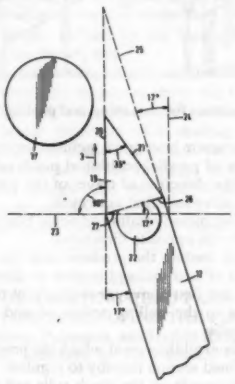
Klaus Koch; Hans-Joachim Schaeffer, both of Lastzen, and Gerhard Syrbius, Grossburgwedel, all of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Nov. 16, 1983, Ser. No. 552,318

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1982, 3242999

Int. Cl.³ B30B 9/14

U.S. Cl. 100—117 11 Claims



1. A worm press for mechanically separating liquid/solid mixtures, said worm press comprising a material feed region and a pressing region downstream, in the direction of material flow, of said feed region, hollow barrel means extending along and defining said feed and said pressing regions, a rotatable worm disposed within said barrel, pin means projecting radially inwardly towards the axis of rotation of said worm from said barrel in said pressing region, said pin means being spaced around the periphery of said barrel, said worm including at least one helical flight formed thereon, said flight being radially interrupted in the region of said pin means so as to define a plurality of flight portions, each said flight portion having, in said direction of material flow, an upstream end region and a downstream end region, said downstream end of said flight portion terminating in a profiled tip portion, means for detachably affixing said profiled tip portion to the adjacent flight portion, said tip portion comprising a shearing flank portion extending substantially at right angles to said axis of rotation of said worm, and a thrust flank portion subtending an acute angle with said shearing flank portion, said thrust flank sub-

tending an angle of from 20° to 50° relative to a line extending perpendicularly to said worm axis of rotation.

4,509,420

UMBRELLA SILK SCREENING FIXTURE

Leon C. Stroffolino, Oceanport, N.J., assignor to Vito J. Paolantonio, Oceanport, N.J.

Filed Oct. 6, 1983, Ser. No. 539,662

Int. Cl.³ B41F *17/00*

U.S. Cl. 101—35 **3 Claims**

1. A device for supporting an umbrella to facilitate printing on a portion of the umbrella comprising: a base; first and second legs extending upwardly from said base; said first leg being slidably mounted for lateral movement along said base, and said second leg being affixed to said base; a first collar affixed to said first leg; a second collar affixed to said second leg; an arm affixed to said second collar and slidably mounted in said first collar; said arm extending from said second collar into said first collar generally parallel to said base; and adjustable support means affixed to said first collar for supporting a portion of the umbrella.

4,509,421

PRINTER HEAD FOR A DOT LINE PRINTER

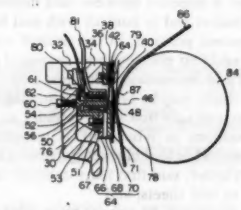
Toshio Kurihara; Masao Kunita; Makoto Yasunaga; Katuya Masuda; Takashi Moriya, and Seiichi Oosawa, all of Tokorozawa, Japan, assignors to Citizen Watch Company Limited, Tokyo, Japan

Filed Dec. 17, 1982, Ser. No. 450,585

Claims priority, application Japan, Jul. 23, 1982, 57-128671; Oct. 26, 1982, 57-162251[U]; Oct. 26, 1982, 57-162252[U]; Oct. 26, 1982, 57-162253[U]

Int. Cl.³ B41J *3/12*

U.S. Cl. 101—93.04 **8 Claims**



1. A printer head for a dot line printer in which the printer head performs impact printing of dot patterns on a periodically advanced printer paper, comprising:

an integrally formed elongated frame composed of a non-magnetic metal and disposed longitudinally in a direction perpendicular to the direction of advancement of said printer paper;

a plurality of first yokes formed of a magnetically permeable material and arrayed at regular spacings along said frame, each of said first yokes having a base portion with a first side fixedly attached to a longitudinally extending plane surface of said frame, each of said first yokes being formed with a coil core protruding from said base portion on a side thereof opposite to said first side and further being formed with a bracket portion protruding from said base portion in the same general direction as said coil core and spaced apart from said coil core;

a plurality of coils each formed around a corresponding one of said coil cores, each of said coil cores having a tip;

a plurality of magnet blocks each attached to a corresponding one of said first yokes and each comprising a permanent magnet and a second yoke mutually attached, each of said second yokes being formed of a magnetically permeable material and having a U-shaped cutout portion formed at an end portion thereof which is disposed adjacent to the tip of the corresponding coil core, and each of said permanent magnets having a pair of magnetic poles with magnetic flux paths, one magnetic pole thereof being coupled to the corresponding first yoke and the opposite magnetic pole being coupled to the corresponding second yoke;

a plurality of leaf springs arrayed along said frame, leaf spring attachment means attaching said leaf spring to said frame, each of said leaf springs having a fixed end and a free end, said fixed ends being fixedly attached to said frame by said leaf spring attachment means at a position which is substantially completely outside the magnetic flux paths of said permanent magnets, said free ends of said leaf springs being disposed adjacent to the tip of a corresponding one of said coil cores;

a plurality of armatures each formed of a magnetically permeable material and fixedly attached to the free end of a corresponding one of said leaf springs at a position directly opposite and adjacent to an end face of the tip of the corresponding coil core such as to be spaced apart therefrom in the absence of the corresponding magnet block and to be attracted onto said tip face when said corresponding magnet block is installed, said U-shaped cutout portion of the corresponding second yoke partially surrounding the periphery of said armature with an air gap therebetween, whereby a major proportion of the magnetic flux of the corresponding permanent magnet passes from the corresponding second yoke, through said air gap, through said armature, and into said coil core;

a plurality of printer rods arrayed in line, each having a narrow rod-shaped configuration and being fixedly attached to a corresponding one of said armatures and protruding therefrom;

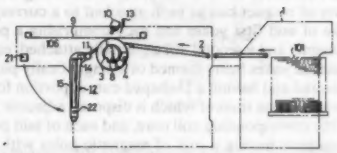
each of said magnet blocks in conjunction with the corresponding first yoke and armature acting to form a path for the magnetic flux of the corresponding permanent magnet, said magnetic flux acting to retain the free end of the corresponding leaf spring in contact with the tip of the corresponding coil core by magnetic attraction exerted on the corresponding armature, and said leaf spring attachment means being arranged such as to provide a desired degree of displacement between the free end and fixed end of each said leaf springs, as measured in a direction perpendicular to the plane of the spring, in said magnetically retained condition, whereby a restoring force corresponding to said degree of displacement is exerted by each of said leaf springs in said magnetically retained condition, each of said coils being responsive to a pulse of drive current passed therethrough for momentarily producing a magnetic flux acting in opposition to the magnetic flux of the corresponding permanent magnet to thereby momen-

tarily release the corresponding leaf spring from the magneticaly retained condition, whereby the corresponding printer rod is caused to impact on said printer paper.

4,509,422
PAPER DISCHARGER IN CYLINDER SCREEN PRINTING MACHINE

Kazuo Nagatani, Seki, Japan, assignor to Sakurai Machine Trading Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 391,551, Jun. 24, 1982, Pat. No. 4,448,124. This application Oct. 12, 1983, Ser. No. 541,146
Claims priority, application Japan, Jun. 10, 1983, 58-104741
Int. Cl.³ B41L *13/00*
U.S. Cl. 101—118 **10 Claims**

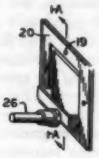


1. A cylinder screen printing machine comprising:
(a) a cylinder rotatable about its own axis in opposite directions;
(b) a screen plate disposed upwardly of said cylinder and movable reciprocably in synchronism with rotation of said cylinder;
(c) a squeezee positioned upwardly of said screen plate for pressing ink through said screen plate onto a sheet of printing paper passing between said cylinder and said screen plate in response to synchronized movements of said cylinder and said screen plate;
(d) a pair of spaced frames;
(e) a paper discharge table located between said spaced frames and downstream of said cylinder for discharging a printed sheet which has been fed from said cylinder, said paper discharge table being retractable downwardly from an upper position to provide a space below said screen plate;
(f) first means for supporting said paper discharge table in said upper position, said first means being operable to allow said paper discharge table to be retracted downwardly; and
(g) second means for positioning a rear end of said paper discharge table vertically and laterally in said upper position with respect to said pair of frames.

4,509,423
MULTI-POSITIONAL HANDLE FOR SEROGRAPHIC SCREEN

Robert S. Kluck, 14681 Pepper Tree Cir., Tustin, Calif. 92680

Continuation-in-part of Ser. No. 401,725, Jul. 26, 1982, abandoned. This application Aug. 29, 1983, Ser. No. 527,556
Int. Cl.³ B05C *17/06*
U.S. Cl. 101—127.1 **7 Claims**

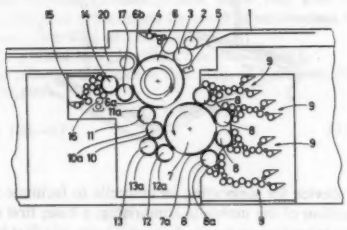


1. A multi-positional transfer device comprising: a serigraphic screen bearing a pattern to be transferred to a surface, said screen being supported by a substantially rigid frame; an open color-medium hopper engaging said frame in liquid-tight relationship, said hopper communicating directly with said screen substantially entirely across one dimension thereof; handle means affixed to said frame and extending outwardly from the plane thereof, said handle means including means for maintaining said hopper in said liquid-tight relationship with said frame; and means for selectively affixing said handle means to each face of said frame.

4,509,424
CONVERTIBLE, MULTICOLOR, ROTARY PRINTING PRESS

Albrecht J. Germann, Würzburg, Fed. Rep. of Germany, assignor to De la Rue Giori S.A., Switzerland

Filed Apr. 5, 1983, Ser. No. 482,234
Claims priority, application Switzerland, Apr. 22, 1982, 2445/82
Int. Cl.³ B41F *11/02*
U.S. Cl. 101—177 **3 Claims**



1. A convertible multicolor printing machine comprising, in one configuration:
a. a blanket cylinder;
b. an impression cylinder spaced away from said blanket cylinder for holding sheets during printing;
c. a first plate cylinder in contact with said blanket cylinder and disposed between said impression and blanket cylinders for transferring a multicolored design to said sheets;
d. a plurality of inking rollers for transferring different colored contours of ink to said blanket cylinder; and
e. means for converting said printing machine into a second configuration, said means comprising means for exchanging said plurality of inking rollers for a plurality of second printing plates which second printing plates transfer multicolored designs to said blanket cylinder, means for moving said impression cylinder from a first position, in one configuration, in which the impression cylinder is spaced away from said blanket cylinder to a second position, in the second configuration, in which said impression cylinder contacts said blanket cylinder,
means for moving said first plate cylinder from a first position, in one configuration, in which said first plate cylinder is disposed between said impression and blanket cylinders and in contact with said blanket cylinder to a second position, in the second configuration, in which said first plate cylinder is spaced away from said blanket and impression cylinders;
whereby sheets may be printed by moving said impression cylinder and said first plate cylinder to said respective first positions in which ink is transferred from said inking rollers to said blanket cylinder which ink the first plate cylinder, said first plate cylinder transferring said design to said sheets; and
whereby sheets may be printed by moving said impression and said first plate cylinders to said respective second positions and exchanging said plurality of inking rollers

for a plurality of second printing plates whereby multicolored designs are transferred from said second printing plates to said blanket cylinder and from said blanket cylinder directly to said sheet in said impression cylinder.

4,509,425

ARRANGEMENT FOR ADJUSTING THE CYLINDERS IN ROTARY PRINTING PRESSES

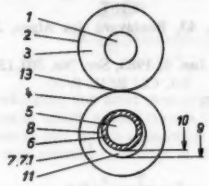
Ulrich Hahn, Taura; Peter Straube, Radebeul, and Michael Koch, Taucha, all of German Democratic Rep., assignors to VEB Kombinat Polygraph "Werner Lamberz" Leipzig, Leipzig, German Democratic Rep.

Filed Aug. 24, 1983, Ser. No. 526,162

Claims priority, application German Democratic Rep., Aug. 24, 1982, 242747

Int. Cl.[3] **B41F** *13/20, 31/34;* **B41L** *27/36*

U.S. Cl. 101—216 **5 Claims**



1. An arrangement for adjusting the distance between two cylinders having axles in a rotary printing press for printing on materials of different thicknesses, the arrangement comprising:

a first roller ring arranged fixedly on and centrically to the axle of the one of the cylinders;

a second roller ring arranged on the other cylinder, the second roller ring defining a bore hole having a diameter and cooperating with the first roller ring; means for mounting the second roller ring for radial movement and

means for maintaining a constant printing pressure of the cylinders during printing of different material thicknesses and including a conical bushing projecting through the bore hole and supporting the second roller ring in the other cylinder, and means for mounting the conical bushing for axial movement with respect to the other cylinder axis so as to radially move the second roller ring and to adjust the distance between the two cylinders so as to maintain, during printing on materials of different material thicknesses, a constant printing pressure at each material thickness.

4,509,426

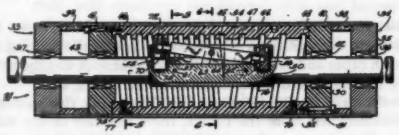
AUTOREVERSING DUAL AXIAL SPEED INK ROLLER

Philip J. Hardin, 850 Park La., Elm Grove, Wis. 53225

Continuation-in-part of Ser. No. 544,258, Oct. 21, 1983, abandoned. This application Aug. 31, 1984, Ser. No. 646,476

Int. Cl.[3] **B41F** *31/14, 31/26;* **B41L** *27/28*

U.S. Cl. 101—348 **19 Claims**



1. An ink roller adapted for oscillating in opposite axial directions, comprising:

a stationary shaft,

support means slidable in opposite axial directions on and rotatable on said shaft,

a cylindrical roller sleeve supported by said support means concentric to said shaft for being driven rotationally and for moving axially on said shaft,

means defining first and second coaxial and axially adjacent helixes in said sleeve concentric to said shaft and rotatable with said sleeve, the twist of the convolutions of one helix being opposite of the twist of the other,

first and second movable follower members arranged in axially spaced apart relationship along said shaft inside of said helixes for cooperating with said first and second helixes, respectively, and

means for moving the first follower member into engagement with the first helix and disengaging the second follower member from the second helix and alternately moving the second follower member into engagement with the second helix and disengaging the first follower member from the helix whereby when the first rotating helix is engaged, it will turn on said first follower member and drive said sleeve in one axial direction and when the second rotating helix is engaged, it will turn on said second follower member and drive said sleeve in the other axial direction.

4,509,427

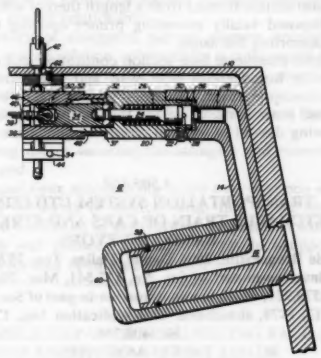
TAIL FIN FIRING DEVICE

Charles R. Andreoli, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 14, 1983, Ser. No. 474,762

Int. Cl.[3] **F42C** *15/00*

U.S. Cl. 102—261 **11 Claims**



1. A tail fin firing device for use in a housing containing deployable tail fins comprising:

a pressure cartridge capable of creating a preset gas pressure;

a spring loaded actuator pin mounted next to said cartridge to trigger pressure release from said cartridge;

a ball retainer with locking balls held to said spring loaded actuator pin by said locking balls to grip said actuator pin until said locking balls release by movement of said ball retainer a predetermined distance;

a lanyard tied to said mounting bar, placed to pull in the direction of said actuator pin movement required to release said locking balls;

a pressure tube connected to said pressure cartridge to direct said gas pressure from said cartridge;

a pusher piston mounted to said pressure tube such that said pusher piston moves when pressure is present above a preset level in said pressure tube; and

means for holding said deployable tail fins by said pusher piston until pusher piston moves a set distance.

4,509,428

SHOTSHELL CASING WITH PARTIALLY TELESCOPED BASEWAD

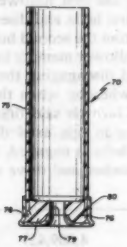
Lake J. Davich; Jack A. Erickson, both of Anoka, and Richard W. Proulx, Forest Lake, all of Minn., assignors to Federal Cartridge Corporation, Minneapolis, Minn.

Continuation of Ser. No. 224,267, Jan. 16, 1981, abandoned. This application Oct. 13, 1983, Ser. No. 541,808

The portion of the term of this patent subsequent to Nov. 13, 2001, has been disclaimed.

Int. Cl.³ F42B 5/30

U.S. Cl. 102—466 **11 Claims**



1. A single-piece plastic shotshell casing comprising:

(a) an elongated tubular body comprised of biaxially oriented thermoplastic material throughout;

(b) said body having wall structure with inner surfaces and having sidewalls terminating at one of its ends in an integral substantially thickened biaxially oriented transverse base section formed from a length thereof with a centrally disposed axially extending primer opening therein, and supporting the same;

(c) said transverse base section contituting an integral internally homogenous base wad and being only partially telescoped axially inwardly in contiguous relation with said inner surfaces within said supporting sidewalls and being devoid of internal physical boundaries.

4,509,429

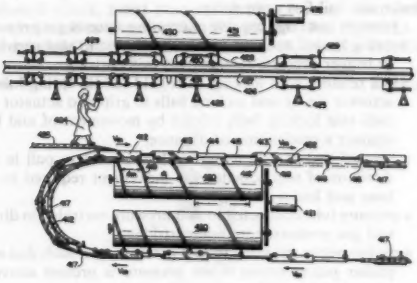
TRANSPORTATION SYSTEM UTILIZING A STRETCHABLE TRAIN OF CARS AND STRETCHABLE BANDCONVEYORS

Axel de Broqueville, 2904 Daniel, Dallas, Tex. 75205

Continuation-in-part of Ser. No. 127,541, Mar. 30, 1980, Pat. No. 4,370,931, which is a continuation-in-part of Ser. No. 19,776, Mar. 12, 1979, abandoned. This application Aug. 17, 1982, Ser. No. 408,746

Int. Cl.³ A63G 1/00

U.S. Cl. 104—25 **36 Claims**



1. A transportation device, comprising:

a plurality of successive load carrying components, each of said components being connected to adjacent components by means which permit the distance between said adjacent components to vary from a mininum distance to a maximum distance and permit said components to move in a closed loop path;

a plurality of endless screws with grooves of predetermined thread pitch patterns and means for rotating said screws;

means associated with said components for engaging said components with said grooves when said components move along said screws, said patterns being arranged whereby the distance between adjacent components varies between said maximum distance and said minimum distance and the speed of said components varies between a maximum speed and a minimum speed as said means moves along the grooves of said endless screws.

4,509,430

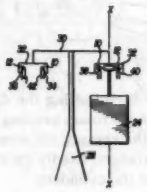
TWIN SUSPENSION/HAULAGE CABLE GONDOLA LIFT

Denis C. Creissels, 43, Boulevard des Alpes, 38240 Meylan, France

Filed Jun. 6, 1983, Ser. No. 501,138

Int. Cl.³ B61B 9/00

U.S. Cl. 104—173 R **14 Claims**



1. An overhead cable transport installation comprising:

terminals having each two pulleys

two parallel suspension haulage cables passing over said pulleys and being continuously driven at the same speed while extending in line in a horizontal plane with constant spacing,

towers including cable support rollers for supporting said two cables at a same level,

gondolas coupled in line to said two cables and each having a suspension bar hanging in the vertical symmetry plane of the cables and a carriage whereon said suspension bar is articulated,

at least one pair of detachable grips secured to said carriage, one grip cooperating with one cable and the other grip of said pair cooperating with the other of said two cables for coupling the carriage to the two cables in line and to disconnect the carriage inside the terminals to allow for embarkation and disembarkation of the passengers of the gondola at reduced speed, each grip having a body that rests on the upper face of the cable in closed position of the grip and protrudes slightly upwards and a pair of jaws protruding downwards from said body to surround and clamp the cable while the end of the jaws become substantially level with the lower face of the cable in order to facilitate passing around the cable support rollers,

cable guide rollers disposed in the terminals in order to deviate said cables so as to modify slightly the spacing to each other and to allow for disengagement or engagement of the carriage disconnected from the cables, and

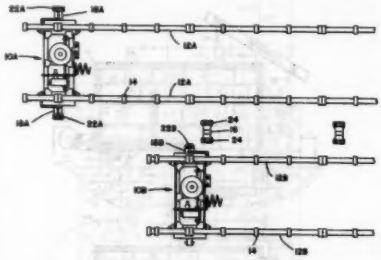
transfer rails in the terminals for supporting the carriage disconnected from the cables, the trajectory of the rails bending downwards with respect to the cables on the travel section corresponding to the modified spacing of the cables for disengagement of the carriage and bending upwards in the travel section for engagement of the carriage.

4,509,431

BRIDGE CRANE HOIST STOP SYSTEM

Gordon J. Laskowski, Port Orchard, Wash., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jul. 5, 1983, Ser. No. 510,702
Int. Cl.³ B61K 7/20
U.S. Cl. 104—250 5 Claims



1. A rail interlocking and hoist stop apparatus for material handling systems in which a hoist travels between a movable rail and a stationary rail, which comprises:

(a) a master stop assembly mounted at the end of the movable rail;

(b) a slave stop assembly mounted at the end of the stationary rail; said master stop assembly including

(1) a master housing;

(2) a master pin slidably disposed in said master housing for movement parallel to the longitudinal direction of said rails, said master pin being moved toward said stationary rail to actuate said apparatus to interlock the rails and allow the hoist to travel between the stationary rail and the movable rail;

(3) a locking pin slidably disposed in said master housing for sliding parallel to the longitudinal direction of said rails, said locking pin being moved away from said stationary rail when said apparatus is actuated;

(4) a master stop pin movably disposed in said master housing for movement into the path of said hoist to prevent travel of said hoist between the movable rail and said stationary rail and for movement out of the path of said hoist to allow travel of said hoist between the movable rail and the stationary rail,

(5) means for coupling the movement of said locking pin to said master stop pin, movement of said locking pin away from said stationary rail moving said master stop pin allowing travel of said hoist between the movable rail and the stationary rail, said slave stop assembly including:

(1) a slave housing;

(2) a slave pin slidably disposed in said slave housing for movement parallel to the longitudinal direction of said rails, said slave pin being aligned with said master pin when the movable rail and the stationary rail are aligned, said slave pin being pushed by said master pin when said apparatus is actuated;

(3) a crossover pin slidably disposed in said slave housing for sliding parallel to the longitudinal direction of said rails, said crossover pin aligned with said locking pin when the movable rail and the stationary rail are aligned, said crossover pin pushing said locking pin when said apparatus is actuated;

(4) means for coupling said slave pin and said crossover pin so that movement of either one of said pins is one direction will cause the other one of said pins to move in the opposite direction;

(5) a slave stop pin movably disposed in said housing for movement into the path of said hoist to prevent travel of said hoist between the movable rail and said stationary rail and for movement out of the path of said hoist to allow travel of said hoist between the movable rail and the stationary rail;

(6) means for coupling the movement of said slave pin and said crossover pin to said slave stop pin, the movement of said crossover pin toward said movable rail moving said slave stop pin to allow travel of the hoist between the stationary rail and the movable rail; and

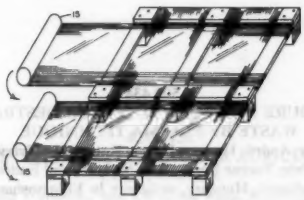
(c) means for sliding said master pin toward said stationary rail to actuate said apparatus.

4,509,432

BLOCK AND STRINGER TYPE LIFT TRUCK PALLET

Michael M. Win, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Apr. 14, 1983, Ser. No. 484,797
Int. Cl.³ B65D 19/00
U.S. Cl. 108—51.1 9 Claims



1. A lift truck pallet comprising in combination:

(a) a plurality of elongated narrow stringers arranged in parallel, spaced relationship;

(b) a plurality of elongated narrow runners arranged in parallel, spaced relation, substantially at right angles to the stringers so as to form the perimeter of a plurality of comparatively broad open spaces;

(c) spacer means defining lift truck fork openings in the sides of the pallet;

(d) fastening means securing the stringers and runners together; and

(e) said broad open spaces being tautly overwrapped with a plurality of layers of stretch wrap film in its tension-stretched condition, so as to form in cooperation with said stringers and runners, plastic film product-supporting surfaces for said open spaces of said pallet.

4,509,433

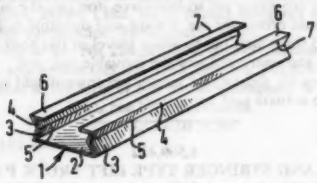
COLLAPSIBLE EXPANSIBLE HANDLING FACILITY FOR UNITIZED AND UNIT LOADS

Kenneth Farr, 3, Victoria La. Colcar, Huddersfield, Yorks, England

PCT No. PCT/GB82/00081, § 371 Date Nov. 9, 1982, § 102(e) Date Nov. 9, 1982, PCT Pub. No. WO82/03057, PCT Pub. Date Sep. 16, 1982
PCT Filed Mar. 9, 1982, Ser. No. 442,196
Claims priority, application United Kingdom, Mar. 10, 1981, 8107561
Int. Cl.³ B65D 19/40
U.S. Cl. 108—52.1 11 Claims

1. A unitised load handling means comprising a sleeve secured to a lower surface of the load, the sleeve being defined by a base to form a ground bearing surface, a pair of opposed side walls joined to the base and each including two side wall sections joined by a longitudinal crease, said sleeve arranged to collapse or expand by bending about the creases, an inturned part joined to the top of said side walls to secure the sleeve to the load, the sleeve when vertically expanded substantially defining an enlarged opening of rectangular cross-section therewithin and when fully collapsed under load defining an

opening of rectangular cross-section therewithin of reduced height and of a width substantially different than when expanded and defining a space sufficient for initial entry of load handling equipment, said opening being laterally defined between said creases, and said creases allowing the sleeve to expand vertically to fully receive the load handling equipment.



4,509,434

PROCEDURE AND EQUIPMENT FOR DESTROYING WASTE BY PLASMA TECHNIQUE

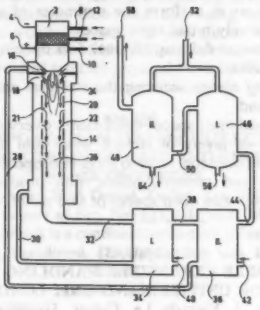
Ottó Bóday; András Herpay; Ferenc Krajcsovics; István Néveri; Sándor Pete; Fereac Pócsy; Béla Szikora, and Endre Szirmai, all of Budapest, Hungary, assignors to Villamosipari Kutato Intezel, Budapest, Hungary

Division of Ser. No. 350,397, Feb. 12, 1982, Pat. No. 4,438,706. This application Nov. 28, 1983, Ser. No. 555,492

Claims priority, application Hungary, Feb. 27, 1981, 485/81

Int. Cl.³ F23G *5/12*

U.S. Cl. 110—238 **7 Claims**



1. Apparatus for destroying fluid waste containing vaporizable organic materials, comprising

a plasma generator;

a plasma reactor comprising a gas permeable ceramic pipe axially arranged with respect to said generator to receive in one end the plasma torch produced by said generator, and a metallic outer housing spaced from said pipe,

means for introducing cooling gas into said housing surrounding said pipe and passing therethrough into contact with the plasma,

said reactor having inlet means for the introduction into one end of said ceramic pipe organic waste vapor and preheated oxygen to react with said plasma completely within said ceramic pipe, and outlet means at the other end of said ceramic pipe for the removal of the reaction end products; and gas washing means for cooling the end products removed from said reactor.

4,509,435

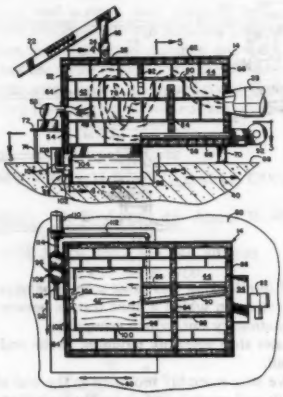
WASTE MATERIAL INCINERATION SYSTEM AND METHOD

Jack C. Adams, Boca Raton, Fla., assignor to Energy Recovery Group, Inc., Boca Raton, Fla.

Division of Ser. No. 448,425, Dec. 10, 1982, Pat. No. 4,440,098. This application Feb. 28, 1984, Ser. No. 584,529

Int. Cl.³ F23J *3/00*; F23G *5/12*

U.S. Cl. 110—344 **29 Claims**



1. A method of incinerating waste material, including the steps of:

(a) inserting waste material into a first combustion zone of a longitudinally directed furnace;

(b) vortexing said combusting waste material in said first combustion zone about an axis line substantially normal said longitudinal direction;

(c) removing particulate material from said combusting waste material in said first combustion zone; and,

(d) passing said first combustion zone combusted waste material products to a second combustion zone of said furnace; wherein the step of vortexing said combusting waste material includes the step of inserting preheated air into a lower section of said first combustion zone of said longitudinally directed furnace, the step of inserting preheated air into said lower section of said first combustion zone includes the step of passing air adjacent said second combustion zone and the step of inserting preheated air includes the step of inserting at least one stream of said preheated air into said lower section of said first combustion zone in a direction inclined to said longitudinal direction.

4,509,436

METHOD OF AND APPARATUS FOR THE DESULFURIZATION OF FLUE GAS OF A COAL-FIRED COMBUSTION PROCESS

Herbert Schröfelbauer; Josef Kakl, both of Klagenfurt; Gernot Staudinger, Graz, and Hermann Filipot, Villach, all of Austria, assignors to Österreichische Draukraftwerke Aktiengesellschaft, Klagenfurt, Austria

Filed Sep. 30, 1983, Ser. No. 537,651

Claims priority, application Austria, Sep. 30, 1982, 3632/82

Int. Cl.³ F23J *11/00*

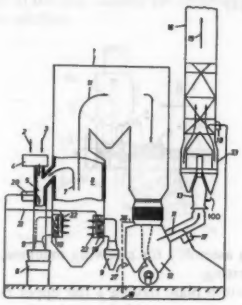
U.S. Cl. 110—345 **13 Claims**

1. A method of desulfurizing a raw gas generated by the combustion of coal in a combustion chamber, said method comprising in combination:

(a) introducing into said combustion chamber a solid sulfur-binding additive adapted to form an additive ash which is entrained in said raw gas;

(b) cooling a quantity of additive ash previously recovered from a flue gas and formed by reaction in a coal-fired combustion chamber to form a cold additive ash;

(c) cooling at least a portion of said raw gas to reduce the temperature thereof to a temperature level above a water dewpoint thereof at which water spontaneously condenses with lowering of temperature;



(d) filtering at least said portion of said raw gas cooled in step (c) to recover additive ash therefrom, thereby forming a clean gas;

(e) discharging said clean gas; and

(f) further cooling at least said portion of said raw gas to substantially said dewpoint following step (c) and prior to step (d) by adding to it said portion of the additive ash cooled in step (b).

4,509,437

PROCESS FOR CLEANING OF FLUE GASES OF A POWER PLANT WITH THE AID OF A COAL DUST BURNING FLAME AND APPARATUS FOR CARRYING OUT THE PROCESS

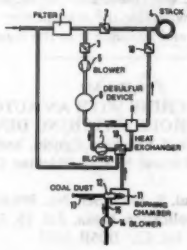
Heribert Breidenbach, Essen, and Udo Strauss, Bochum, both of Fed. Rep. of Germany, assignors to Steag AG, Fed. Rep. of Germany

Division of Ser. No. 412,105, Aug. 27, 1982, Pat. No. 4,430,951. This application Feb. 10, 1984, Ser. No. 579,189

Claims priority, application Fed. Rep. of Germany, Sep. 15, 1981, 3136480

Int. Cl.³ F23J *11/00*

U.S. Cl. 110—345 **4 Claims**



1. A process for the cleaning of flue gases heated in a coal dust fired power plant boiler comprising the steps of:

filtering the flue gases to remove dust therefrom;

wet desulfurizing at least a portion of the flue gases;

burning coal dust to provide reheating gases for the flue gases;

filtering the reheating gases to remove dust; and

mixing a portion of the desulfurized flue gases and the reheating gases to reheat the flue gases for discharge from the power plant.

3. Apparatus for cleaning flue gases heated in a coal dust fired power plant boiler comprising:

a dust filter for receiving flue gases from the boiler and for removing dust therefrom;

a wet desulfurization means coupled to said dust filter for desulfurizing at least a portion of the flue gases;

at least one coal dust burner for providing reheating gases for the flue gases;

a mixer coupled to said wet desulfurization means and said coal dust burner for mixing desulfurized flue gases and the reheating gases to reheat the flue gases for discharge from the power plant; and

dust filter means coupled to said burner for removing dust from the reheating gases.

4,509,438

COMBINATION IMPLEMENT FOR AGRICULTURAL CULTIVATION

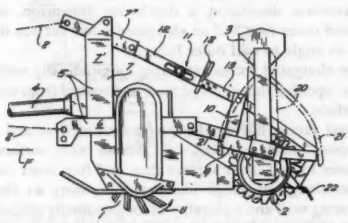
Willy Rau, Weilheim, and Christian Taus, Kirchheim, both of Fed. Rep. of Germany, assignors to Maschinenwerk Rau GmbH, Weilheim, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,463

Claims priority, application European Pat. Off., Aug. 31, 1982, 82107986.0

Int. Cl.³ A01C *7/08;* **A01B** *49/06*

U.S. Cl. 111—13 **11 Claims**



1. A combination implement for agricultural cultivation, comprising

a main frame liftably connectable with a pulling or dragging vehicle and carrying a cultivating device;

an auxiliary frame carrying a crumbler roller which supports the implement during cultivation, said auxiliary frame being hinged to the main frame to form an extension of the latter which is pivotable about a transverse axis;

a telescopic supporting member linked at the ends thereof between said main- and auxiliary frames and including adjustable stop means for limiting pivotal movement of the auxiliary frame in upward direction, the telescopic supporting member having a tubular part linked to the main frame and a shifting part slidably movable in the tubular part;

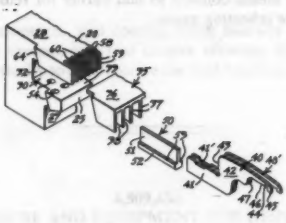
the adjustable stop means including perforations provided in the shifting part and an abutment member engageable in any selected one of said perforations to adjustably limit the displacement of the shifting member into the tubular member.

4,509,439

CLAMP INSERT FOR TUFTING ELEMENTS IN NARROW GAUGE TUFTING MACHINE

John C. Densmore, Dalton, Ga., and Charles W. Watkins, Ooltewah, Tenn., assignors to Tuftco Corporation, Chattanooga, Tenn.

Filed Sep. 30, 1983, Ser. No. 537,598
Int. Cl.³ D05C 15/00
U.S. Cl. 112—79 R 9 Claims



1. In a narrow gauge, multiple-needle tufting machine having a plurality of cooperative reciprocable tufting elements, including needles and looper hooks, for producing a tufted pile fabric, a clamping apparatus for a plurality of tufting elements, comprising:

(a) an elongated bar having a longitudinal dimension, a transverse dimension, a depthwise dimension, an elongated outer face and an elongated outer surface disposed at an angle to said outer face,

(b) an elongated recess extending longitudinally within said bar, opening through said face, and spaced from said outer surface,

(c) said recess having depthwise spaced first and second opposed inner surfaces, said second inner surface being closer to said outer surface than said first inner surface,

(d) an elongated gauge member comprising an elongated bearing wall and a plurality of longitudinally spaced parallel partition walls projecting away from said bearing wall and defining gauge slots between said partition walls,

(e) a clamp member having an elongated divider member of predetermined thickness adapted to be received within a gauge slot, and a clamp head projecting from both sides of said divider member to form opposite interior clamp seats and an exterior bearing surface,

(f) said gauge member being received within said elongated recess with said bearing wall opposing said first inner surface, in assembled position,

(g) said clamp member being received within said elongated recess with said divider member inserted in a corresponding gauge slot and spaced between a pair of opposed partition walls to receive a pair of tufting elements within said gauge slot on opposite sides of said divider member, in assembled position, and

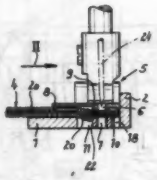
(h) set screw means projecting through said elongated outer surface of said elongated bar and said second inner surface into said recess for engaging said exterior bearing surface of said clamp member to force said clamp member into a corresponding gauge slot to clamp tufting elements within said gauge member, in assembled position.

4,509,440

STITCHING ASSEMBLY FOR SELVEDGING MACHINE

Johannes Freermann, Ochtrup, Fed. Rep. of Germany, assignor to Carl Schmale KG, Ochtrup, Fed. Rep. of Germany

Filed Jun. 24, 1983, Ser. No. 507,870
Claims priority, application Fed. Rep. of Germany, Jul. 21, 1982, 3227198
Int. Cl.³ D05B 35/10, 29/06
U.S. Cl. 112—153 6 Claims



1. A stitching assembly for a sewing machine, the stitching assembly comprising:

a stationary stitch plate having a flat upper face defining a stitching location, provided on the face adjacent the stitching location with an upstanding edge guide extending in and defining a transport direction, and formed with an upwardly open elongated groove extending upstream in the transport direction from the stitching location and having an outer flank turned inward and mainly parallel to the edge guide and an inner flank turned away from and mainly parallel to the edge guide;

a presser foot having a sole plate with a lower face turned toward and confronting the upper face of the stitch plate at the stitching location and provided on its lower face with a downwardly projecting guide ridge that extends in the transport direction and that has an inner flank turned toward and generally parallel to the edge guide and an outer flank turned away from and generally parallel to the edge guide, the outer flank of the ridge being aligned over the inner flank of the groove, the inner flank of the groove diverging from the outer flank of the groove from a point upstream in the direction from the stitching location, whereby a thick web workpiece can have a turned-over thin edge held between the ridge and the edge guide while the thick portion of the workpiece lies outside the ridge, the sole plate and stitch plate being formed between the edge and the ridge with vertically aligned needle holes; and

at least one transporter engageable through the stitch plate between the ridge and the edge guide with the turned-over edge of the workpiece and displaceable in the transport direction, whereby the transporter can engage the web workpiece and advance it in the transport direction.

4,509,441

SEWING MACHINE WITH AN AUTOMATIC BUTTONHOLE STITCHING DEVICE

Yoshimichi Tamiya, and Yasukata Eguchi, both of Tokyo, Japan, assignors to Janome Sewing Machine Co. Ltd., Tokyo, Japan

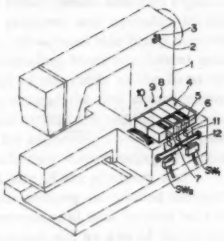
Filed Jul. 9, 1982, Ser. No. 396,692
Claims priority, application Japan, Jul. 16, 1981, 56-110039
Int. Cl.³ D05B 3/02
U.S. Cl. 112—158 B 3 Claims

1. A sewing machine of a type including a machine motor and an automatic buttonhole stitching device having a plurality of pattern cams selectively operated to form a series of stitches of a buttonhole in predetermined sequential steps, the buttonhole stitching device comprising:

pattern selecting means including a predetermined number of pattern cam selecting buttons selectively operated to select said pattern cams;

switch means operated in association with the selective operation of said pattern cam selecting buttons to produce buttonhole sequence signals indicating predetermined sequential steps for forming the stitches of the buttonhole;

electronic control means responsive to the buttonhole sequence signals of the switch means for storing a number of stitches formed in each sequential step for once produced buttonhole to thereby control the following formation of buttonhole stitches;



detecting means responsive to the buttonhole sequence signals of said switch means and to an output of said electronic control means to produce sequence detecting signals; and

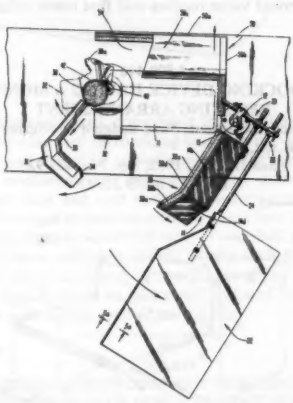
indicating means responsive to the sequence detecting signals of said detecting means to indicate the sequential steps of stitching the buttonhole.

4,509,442

ACOUSTICAL SHIELD ASSEMBLY FOR A SEWING MACHINE

Lee W. Gregory, Hickory, N.C., assignor to Marvel Specialty Company, Hickory, N.C.

Filed May 16, 1983, Ser. No. 494,778
Int. Cl.³ D05B *77/00*
U.S. Cl. 112—261 **14 Claims**



1. An acoustical shield assembly adapted for attenuating noise generated by a sewing machine or the like, comprising:

(a) a support post;

(b) a front shield mounted to the support post for movement relative to the support post to permit movement toward and away from the front face of the sewing machine;

(c) an acoustical covering on the interior of the front shield, said acoustical covering being closely spaced and substantially conforming to the front of the sewing machine so as to be operative for attenuating noise generated by the sewing machine; and

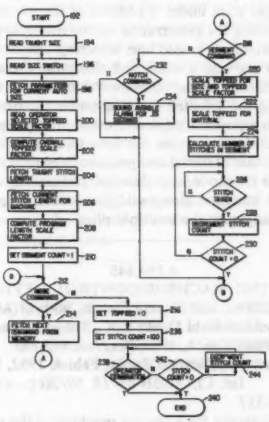
(d) a face shield mounted for movement with respect to said support post, said face shield being transparent and adapted for selective positioning between the sewing machine and the adjacent face of the operator to allow observation of the sewing operation, said face shield being movable into overlapping relationship with said front shield when the front shield and the face shield are operatively positioned.

4,509,443

AUTOMATIC SEWING MACHINE AND METHOD FOR JACKET SLEEVE ATTACHMENT

Charles R. Martell; Elmer N. Leslie, both of Dallas, and Stephen S. Treadwell, Richardson, all of Tex., assignors to Microdynamics, Inc., Dallas, Tex.

Filed Mar. 1, 1983, Ser. No. 462,568
Int. Cl.³ D05B *27/08*
U.S. Cl. 112—262.1 **11 Claims**



1. A method for stitching pieces of material together with a specified fullness distribution for a plurality of different sizes and styles of a garment comprising:

storing first information regarding the number of stitches defining the length of differential feed zones for a specific garment size or style;

storing second information regarding the magnitude of differential feed for each differential feed zone for said specific garment size or style;

storing third information relating to variations in the number of stitches defining the length of differential feed zones for a plurality of different garment sizes or styles;

storing fourth information relating to variations in the magnitude of differential feed rates for a plurality of different garment sizes or styles;

sensing the stitch count of the material being sewn; and

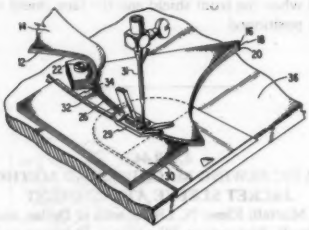
automatically adjusting the magnitude of the differential feed and length of the differential feed zones of said material being sewn in dependence upon said stitch count and said first, second, third and fourth stored information, wherein different fullness distribution is automatically provided to a plurality of different garment sizes or styles being sewn.

4,509,444

FOOT LEVELING SEWING AID AND METHOD OF USE

Clarice M. Howe, Westfield, and Audrey Mack, Colonia, both of N.J., assignors to The Singer Company, Stamford, Conn.

Filed Apr. 27, 1983, Ser. No. 488,937
Int. Cl.³ D05B *35/00*
U.S. Cl. 112—262.1 **3 Claims**



1. A method of sewing stitches in multiple plies of fabric on a sewing machine along a line permitting only a portion of the presser foot of the machine to extend over the multiple plies during a sewing operation, the said method comprising disposing the multiple plies under a portion of the presser foot in a position providing for penetration of the multiple plies by the needle of the machine in said line, selecting one or more layers of material to provide a combined thickness thereof substantially corresponding to the combined thickness of the multiple plies, disposing the selected material under the presser foot of the machine in a position adjacent to the multiple plies, lowering the presser foot to cause the foot to engage the multiple plies as well as said material and press both against the feed dog of the machine for movement thereby, and sewing the multiple plies with the machine along said line while maintaining the said material adjacent the multiple plies.

4,509,445

SEWING MACHINE CONTROL DEVICE

Katsuhiro Fujikawa, and Osamu Gohda, both of Aichi, Japan, assignors to Mitsubishi Denki K.K., Tokyo, Japan

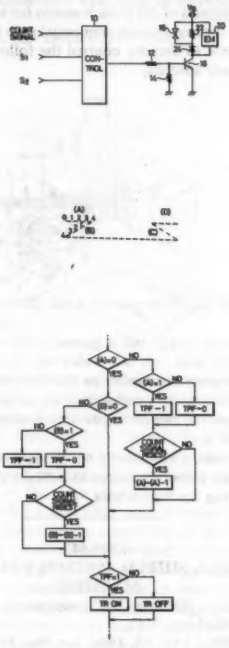
Filed Feb. 4, 1983, Ser. No. 463,763
Claims priority, application Japan, Feb. 4, 1982, 57/16611
Int. Cl.³ D05B *69/18, 69/20*
U.S. Cl. 112—317 **16 Claims**

1. A control device for a sewing machine of the type including means for generating a stitch signal corresponding to each stitch sewed, means for indicating a desired stitch count representing the number of stiches to be sewed while feeding an article in a first direction, and reverse-stitching electromagnetic operating unit for controlling the direction of feed of said article in response to an electrical instruction signal, said electromagnetic operating unit turning "on" in response to a first state of said electrical instruction signal to feed said article in said first direction and turning "off" in response to a second state of said electrical instruction signal to feed said article in a second direction, said control device further including control means for controlling the on and off switching of said electromagnetic operating unit, said control means comprising:

delay means for controlling the duration of a delay time interval between the switching of said electrical instruction signal from said first state to said second state and the corresponding switching of said electromagnetic operating unit from "on" to "off";

counting means responsive to said stitch signal for generating an actual stitch count signal representing the number of stitches which have been sewed while feeding said article in said first direction; and

means for determining when said actual stitch count reaches a first count value which is less than said desired stitch count value by a predetermined amount, said predetermined amount corresponding to said delay time interval, said control means switching said electrical instruction signal from said first state to said second state when said actual count value reaches said first count value.

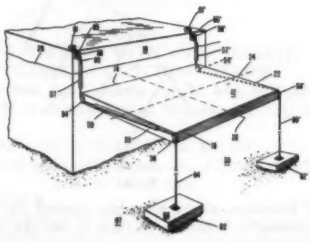


4,509,446

DRYDOCKING DEVICE HAVING A MOMENT RESISTING ARRANGEMENT

John R. Sutton, Beaumont, Tex., assignor to Marine Concepts, Inc., Beaumont, Tex.

Filed Dec. 21, 1982, Ser. No. 451,923
Int. Cl.³ B63B *35/42*
U.S. Cl. 114—45 **6 Claims**



1. A drydocking device operable for providing a predetermined bouyancy for raising and lowering a vessel relative to a surface of a body of water, comprising:

a pontoon having at least one chamber within the pontoon;

means for selectively introducing air or water into the cham-

ber within the pontoon for raising and lowering the pontoon, respectively;

a fixed structure positioned adjacent to at least a portion of a first side of the pontoon;

means for resisting moments tending to rotate the pontoon out of a substantially horizontal plane, including

means for creating an induced moment in a first direction tending to rotate the first side downwardly,

first rotary means attached adjacent to the first side of the pontoon and operable to rotate with respect thereto and second rotary means attached adjacent to a second side of the pontoon and operable to rotate with respect thereto, the second side being opposite to the first side,

a cable extending from attachment means for securing a first end of the cable to the fixed structure, the cable passing around the first rotary means, across the pontoon and around the second rotary means to anchoring means for anchoring a second opposite end of the cable, the anchoring means being arranged adjacent to the second side of the pontoon; and

the means for creating an induced moment including at least one permanent void tank located between the second side of the pontoon and an axis of the pontoon.

4,509,447

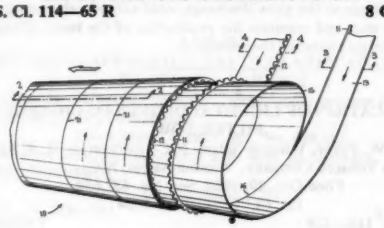
HELICAL SEAMED STRUCTURAL VESSEL AND METHOD OF FORMING SAME

Richard H. Smith, Sr., Bloomfield, N.J., assignor to Universal Spiralweld Enterprises, Inc., Bloomfield, N.J.

Continuation-in-part of Ser. No. 282,082, Jul. 10, 1981, Pat. No. 4,429,654. This application Jun. 28, 1983, Ser. No. 508,509

Int. Cl.³ B63B *9/06, 3/00;* **F16L** *9/16, 9/18*

U.S. Cl. 114—65 R **8 Claims**



1. A structural vessel, comprising an inner tubular liner and an outer tubular shell surrounding said liner in spaced relation, said liner and said shell comprising helically curved strips of material, continuous and helically curved spacer means between said liner and said shell, said spacer means spanning contiguous edges at successive turns of said liner and spanning contiguous edges at successive turns of said shell, said liner and said shell being relatively shifted axially such that said shell edges are out of alignment with said liner edges, means securing said spacer means to said strips and said liner edges together as well as said shell edges together.

4,509,448

QUICK DISCONNECT/CONNECT MOORING METHOD AND APPARATUS FOR A TURRET MOORED DRILLSHIP

Floyd T. Pease, and Joseph T. Shelton, both of Houston, Tex., assignors to Sonat Offshore Drilling Inc., Houston, Tex.

Filed Oct. 13, 1983, Ser. No. 541,539

Int. Cl.³ B63B *21/50*

U.S. Cl. 114—293 **20 Claims**

1. A disconnect/connect mooring system for a turret moored drillship comprising:

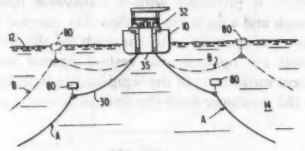
an anchor for releasably engaging the bed of a body of water;

a first mooring line connected at one end to said anchor, said first mooring line including

a length of wire rope operably connected at one end to said anchor and extending upwardly within the body of water, and

a mooring line chain connected at one end to the other end of said length of wire rope at a location remote from said anchor, said mooring line chain having a length substantially less than the length of said wire rope;

a submersible buoy connected to said mooring line chain and having a buoyancy sufficient to float with said length of wire rope and said mooring line chain of said first mooring line suspended from said submersible buoy; and



a second mooring line operably connected to said first mooring line and extending to the turret moored drillship such that upon tensioning of said second mooring line from said drillship said submersible buoy will be drawn into the body of water and said first mooring line will form a first catenary between said anchor and the submerged buoy and said second mooring line will form a second catenary between said submerged buoy and the turret moored drillship and upon release of said second mooring line from operable connection with said first mooring line said buoy will float on the surface of the body of water carrying said first mooring line, wherein said turret moored drillship may be facilely disconnected and connected from said mooring system.

4,509,449

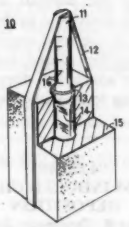
TEMPERATURE/TIME LIMIT INDICATOR

Stephen P. Chalmers, 21 Martha's La., Scituate, Mass. 02066

Filed Nov. 5, 1982, Ser. No. 439,615

Int. Cl.³ G01K *3/00, 11/08*

U.S. Cl. 116—218 **16 Claims**



1. A temperature-time limit indicator comprising:

an elongated container provided with an opening at one end, which container holds a measured volume of frozen fluid which frozen fluid is known to desolidify at a specified desired temperature;

a temperature insulating layer surrounding the container except for the opening;

an elongated temperature indicating member fitting in a loosely slidable manner within the container through the opening;

a means of exerting a force on the indicating member press-

ing it into the container against the frozen fluid causing the temperature indicating member to maintain contact with the solid frozen fluid as the frozen fluid desolidifies, moving the indicating member into the container at a measured rate relative to temperature and time of desolidification;

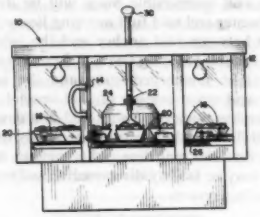
a casing enclosing the container and the insulating layer, and substantially enclosing the temperature indicating member with only a small portion of one end of the temperature indicating member protruding beyond the casing and one portion of the casing permitting the visual monitoring of the movement of the temperature indicating member wherein the protruding end of the temperature indicating member is provided with a transverse opening therethrough and a rigid pin is removably inserted through the transverse opening with the ends of the pin extending beyond the opening and resting against the casing to prevent movement of the temperature indicating member into the container until the limit indicator is prepared for use.

4,509,450

SANITARY FOOD DISPENSER

Joseph S. Jondahl, 9142 S. Lakewood, Tulsa, Okla. 74136

Filed Oct. 25, 1982, Ser. No. 436,599
Int. Cl.³ B05C *5/04*
U.S. Cl. 118—20 **6 Claims**



1. A food dispenser comprising:

(a) a sanitary, windowed enclosure;

(b) a carousel within said enclosure adapted to hold containers of individual servings of food visible through said window;

(c) a door in said enclosure for access to said visible individual food servings and adapted to index said carousel through a rotation equivalent to the advancement by the relative position of one food serving for each time said door is opened and then closed; and

(d) a sauce dispenser adapted to dispense sauce on the next visible food serving to be withdrawn from said food dispenser.

4,509,451

ELECTRON BEAM INDUCED CHEMICAL VAPOR DEPOSITION

George J. Collins; Lance R. Thompson; Jorge J. Rocca, and Paul K. Boyer, all of Ft. Collins, Colo., assignors to Colromm, Inc., Fort Collins, Colo.

Filed Mar. 29, 1983, Ser. No. 479,987
Int. Cl.³ C23C *13/08*; B05D *3/06*
U.S. Cl. 118—50.1 **25 Claims**

1. A chemical vapor deposition and native film growth apparatus for depositing or growing films on a substrate, the apparatus comprising:

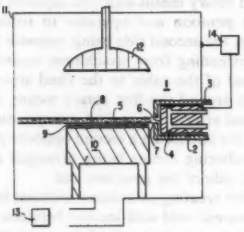
a reaction chamber;

means for supporting the substrate within the reaction chamber;

means for controlling the temperature of the substrate supported within the reaction chamber;

means for introducing one or more selected gases into the reaction chamber;

a glow discharge, cold cathode electron gun for producing a beam of high energy electrons, said glow discharge, cold cathode electron gun being positioned within the reaction chamber for exciting, ionizing, and dissociating molecules of the one or more gases introduced into the reaction chamber in a region therein defined by the beam of high energy electrons;



vacuum pump means for evacuating the reaction chamber and for causing the one or more gases introduced into the reaction chamber to flow through the reaction chamber;

gas flow control means for controlling the flow and pressure of the one or more gases introduced into the reaction chamber such that the gas pressure in the reaction chamber is maintained within the range of 0.05 Torr to 5 Torr; and

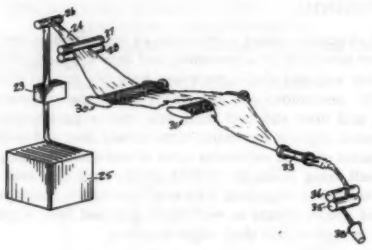
power supply means for providing a source of negative high voltage to the glow discharge, cold cathode electron gun to start and maintain the production of the beam of high energy electrons therefrom.

4,509,452

APPLICATION OF LIQUID ADDITIVES TO CIGARETTE FILTER TOW

James W. Pryor, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.

Filed Oct. 29, 1982, Ser. No. 437,654
Int. Cl.³ B05C *5/00, 9/04*
U.S. Cl. 118—234 **7 Claims**



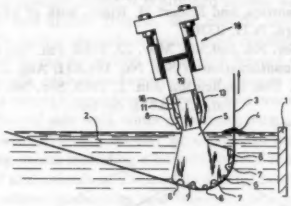
1. Apparatus for applying a liquid additive to a moving band of continuous, multifilament filter tow comprising a liquid applicator provided with a porous metal surface adapted for contacting said band of filter tow, means for supplying controlled amounts of liquid additive to said porous metal surface, means for continuously moving the band of filter tow in contacting relationship across said porous metal surface and wherein said porous metal surface is provided with tow spreading means comprising a plurality of ridges arranged at angles which are inclined with respect to the path of the moving band of filter tow so that the filter tow is urged to move laterally from the central portion of the band of filter tow to each edge of said band of filter tow.

4,509,453

APPARATUS FOR CONTINUOUSLY DIP-ZINCING OF METALLIC WIRE OR STRIP MATERIAL

Giulio Zaccheroni, Via della Grada 6, Bologna, Italy

Filed Nov. 30, 1982, Ser. No. 445,634
Claims priority, application Italy, Nov. 30, 1981, 3591 A/81
Int. Cl.³ B05C 3/12
U.S. Cl. 118—420 6 Claims



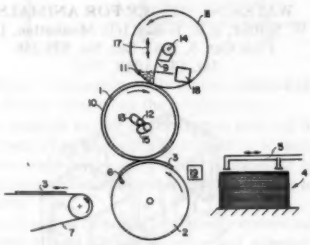
1. Apparatus for continuously zinc-coating metallic wire, strip material or the like in a zinc melt dip bath, comprising a stationary return guide member at least partially immersed in said bath for guiding the material to be zinc-coated therethrough and redirecting it substantially vertically upwards, said return guide member (5) comprising a plurality of separate guide surfaces (6) extending transversely to the running direction of said material (3) and cooperating to define the path of the material through said bath (2).

4,509,454

PRINTING APPARATUS, PARTICULARLY ADAPTED TO APPLY A VARNISH

Jacobus G. Vertegaal, Boxmeer, Netherlands, assignor to Stork Brabant B.V., Netherlands

Filed May 27, 1983, Ser. No. 498,843
Claims priority, application Fed. Rep. of Germany, Jun. 2, 1982, 8215996[U]
Int. Cl.³ B05C 1/02
U.S. Cl. 118—681 8 Claims



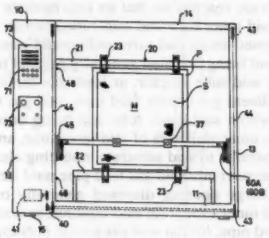
1. Apparatus adapted to apply a layer of viscous sticky material, particularly varnish, in the form of a pattern or otherwise, to a substrate, comprising an applicator roll and means for applying the viscous material to said roll, the substrate being fed by feed means between the applicator roll and an impression roll, the means for applying the viscous material to the applicator roll consisting of a cylindrical screen stencil with an internal squeegee, means for rotating said applicator roll and said cylindrical screen stencil in opposite directions to produce a circumferential movement of the applicator roll and screen stencil in the same direction at the point where they meet, the circumferential speed of the applicator roll being greater than that of the cylindrical screen stencil.

4,509,455

APPARATUS FOR APPLYING EMULSION ONTO SCREEN PRINTING PLATE

Kenji Shirataki, Tokyo, Japan, assignor to Tokai Shoji Co. Ltd., Tokyo, Japan

Filed Jun. 25, 1984, Ser. No. 624,060
Claims priority, application Japan, Aug. 27, 1983, 58-156776
Int. Cl.³ B05C 3/00, 11/00
U.S. Cl. 118—696 6 Claims



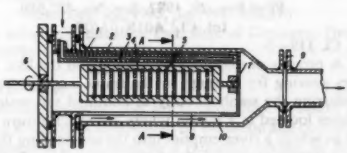
1. An apparatus for applying an emulsion onto a screen printing plate, which comprises a base consisting of a frame having side walls at its opposite sides; a supporting mechanism having clamps for supporting the screen vertically; a lifting mechanism for lifting along the screen an applying squeegee and a scraping squeegee arranged on both sides of the screen; actuating mechanisms for the squeegees, one of said actuating mechanisms allowing the applying squeegee to move toward the screen, to be contacted at its leading edge with the screen and to be inclined upon its upward movement, while the other actuating mechanism allows the scraping squeegee to be not contacted with the screen, or to move toward the screen and to be contacted at its leading edge with the screen but not to be inclined upon its upward movement, both of said squeegees being restored to their horizontal state and retreated to be spaced apart from the screen face upon their downward movement; and a controlling mechanism for controlling the movement of each squeegee for allowing the applying squeegee to apply the emulsion and the scraping squeegee to scrape and recover the emulsion.

4,509,456

APPARATUS FOR GUIDING GAS FOR LP CVD PROCESSES IN A TUBE REACTOR

Michael Kleinert; Rainer Möller, and Horst Stelzer, all of Dresden, German Democratic Rep., assignors to VEB Zentrum für Forschung und Technologie Mikroelektronik, Dresden, German Democratic Rep.

Filed Jun. 18, 1982, Ser. No. 389,750
Claims priority, application German Democratic Rep., Jul. 28, 1981, 232136
Int. Cl.³ C23C 13/08
U.S. Cl. 118—715 11 Claims



1. An apparatus for guiding gas through a tube reactor and in contact with a plurality of substrates within said tube reactor, in low pressure chemical vapor deposition processes, which comprises a substantially rectilinear tube reactor, a generally centrally oriented substantially rectilinear substrate

mounting element disposed within the interior of said tube reactor, said substrate mounting element being substantially parallel to the longitudinal axis of said tube reactor, and being provided with means to receive and mount a plurality of substrates, so that said substrates are disposed in a generally parallel and spaced-apart disposition with respect to each other along said substrate mounting element, and in a substantially perpendicular orientation relative to both said substrate mounting element and the longitudinal axis of said tube reactor, a generally rectilinear cup-shaped inner tube within and spaced from said tube reactor, so that an intermediate zone is formed between said inner tube and said tube reactor, said inner tube being disposed about and surrounding said substrate mounting element, and being oriented generally parallel to the longitudinal axis of said tube reactor, at least one foraminous substantially rectilinear gas supply feed pipe, said gas feed pipe being disposed within said inner tube and being contiguous with a continuous inner wall area of said inner tube, and being spaced from and parallel to said substrate mounting element, means to pass a gas stream into said gas feed pipe, said inner tube having a gas discharge opening disposed generally on the opposite side of said inner tube from said continuous wall area adjacent said gas feed pipe, so that said gas stream is discharged into said inner tube from the openings in said gas feed pipe and flows transversely to the longitudinal axis of said tube reactor and between and across the surfaces of said substrates, and is discharged from said inner tube through the gas discharge opening in said inner tube and into said intermediate zone between said inner tube and said tube reactor, and means to remove discharged gas from said intermediate zone and out of said tube reactor, so that the gas stream flow is suctioned off, in the flow direction, immediately after flowing transversely to the longitudinal axis of said tube reactor and between and across the surfaces of said substrates, and is suctioned out of said tube reactor outside the substrate areas.

4,509,457

ANIMAL LITTER AND PROCESS FOR THE PRODUCTION THEREOF

Hartmut Durbye, Kirchlintein-Luttum, Fed. Rep. of Germany, assignor to Mars Inc., McLean, Va.

Filed May 28, 1982, Ser. No. 383,010

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3121403

Int. Cl.³ A01K *1/015*

U.S. Cl. 119—1 **20 Claims**

1. Animal litter comprising an odor-suppressing granular or powder porous inorganic material which has been uniformly contacted with a gaseous or liquid acidic substance to neutralize alkalinity therein and impart to said inorganic material a weakly acidic pH between approximately 5.8 and 6.2, and said litter characterized by exhibiting good adsorption for odors from animal excrement having a pH in the weak acid range.

4,509,458

PROCESS OF SEA-RANCHING SALMON AND THE LIKE

Robert H. Rines, and Albert H. Knowles, both of Concord, N.H., assignors to K. R. Associates, Inc., Concord, N.H.

Filed Sep. 29, 1982, Ser. No. 427,950

Int. Cl.³ A01K *61/00*

U.S. Cl. 119—3 **11 Claims**

1. A process of sea-ranching salmon and the like, that comprises, rearing fry through to the smolt stage in fresh water; transferring the smolt directly to confined salt-water holding volumes located at a region where sea-ranch return is desired such as where a river empties into the sea; feeding the smolt in such volumes over periods of time not only sufficient to imprint said region upon the smolt for sea-return purposes but also sufficient to enable substantial growth in the salt water over the size at the time of introduction into the said salt-water holding volumes; holding some of said smolt in such volumes at said region continually over extended periods of time sufficient for such smolt to reach maturity at the same region while other smolt in such volumes are released to the sea for ranching; the effluent from said volumes being continually present at said region, assisting not only in the initial imprinting of the smolt-to-be-released to the sea but also in attracting the subsequent sea return of the released smolt to said region.

4,509,459

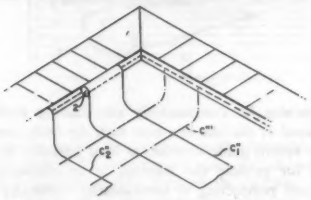
PROCESS AND APPARATUS FOR FISH GROWTH ACCELERATION

Albert H. Knowles, and Robert H. Rines, both of 13 Spaulding St., Concord, N.H. 03301

Division of Ser. No. 360,563, Mar. 22, 1982, Pat. No. 4,399,770, which is a continuation of Ser. No. 181,831, Aug. 27, 1980, abandoned. This application Jun. 2, 1983, Ser. No. 500,349

Int. Cl.³ A01K *63/00*

U.S. Cl. 119—3 **2 Claims**



1. For use in a contained water volume having a border at least at the water surface and fish contained therein, apparatus comprising the combination of a plurality of elongate, light-blocking cover sheets of soft, resilient material and means for suspending said cover sheets respectively from opposite parts of said border at successive laterally spaced positions along said border and in an arrangement that provides cover sheets that are orthogonal to one another and that provides successive laterally spaced dark areas beneath said cover sheets, wherein the fish may stack and rest in darkness, with intervening light areas corresponding to the spaces between adjacent cover sheets, each of said cover sheets, when suspended, having major portions in the water.

4,509,460

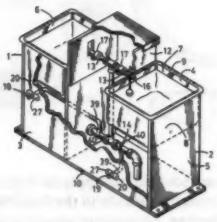
WATERING DEVICE FOR ANIMALS

Leonard W. Seltzer, R.R. 1, Box 160, Manhattan, Ill. 60442

Filed Oct. 5, 1983, Ser. No. 539,248

Int. Cl.³ A01K *7/02*

U.S. Cl. 119—74 **13 Claims**



1. A watering device for animals, comprising a housing having a peripheral side wall, first drinking means in said housing located therein at a first preselected height for animals of a relatively greater height to drink from, said first drinking means including a pan having an open top wall seated in said housing to receive water therein for drinking by said animals of said relatively greater height, second drinking means in said housing located therein at a second preselected height for animals of a relatively shorter height to drink from, said first

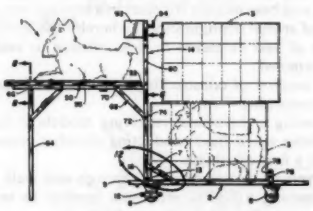
preselected height being higher than said second preselected height, said housing including therein water intake means, said first and second drinking means both being positioned to receive water from the same said water intake means, bracket means to mount said drinking means in said peripheral side wall of said housing, at least one aperture in said side wall, said bracket means including inwardly facing tubular projection means having a peripheral configuration and dimension corresponding to that of said aperture to seat snugly in said aperture when said bracket means is positioned against said peripheral side wall and affixed thereto, said bracket means including outwardly facing projection means, said inwardly facing and outwardly facing projection means each having a central bore therethrough, each of said central bores being in registration to provide a through passageway through said bracket means and said peripheral side wall, water dispensing means connected to said outwardly facing tubular projection means, said water dispensing means including a portion thereof receivable in the mouth of said animals of a relatively shorter height, first water conduit means connecting said inwardly facing tubular projecting means to said water intake means and second water conduit means connected to said water intake means having an outlet positioned to pour water into said pan of said first drinking means.

4,509,461

ANIMAL TRANSPORT AND GROOMING DEVICE

Paul P. Peck, 18918 Hartland St., Reseda, Calif. 91335

Filed Aug. 15, 1983, Ser. No. 523,460
Int. Cl.³ A61D *3/00*
U.S. Cl. 119—103 **13 Claims**



1. A compact, collapsible, easily moved animal transport and grooming device comprising the combination of:

a chassis member having a roller means attached thereto for movement of said chassis and formed by at least two side elements held in spaced, parallel relationship by at least one transverse element connected at its termini to said side elements;

a U-shaped support member operatively connected adjacent one end of said chassis member and adapted to being placed into a folded position on top of said chassis member and an erected position away from said chassis member so as to form a support;

a brace member formed by pivotally connected link members operatively connected at one end to said chassis member and at the other end to said U-shaped support member to permit erection of said U-shaped support member in a secure manner and to hold said U-shaped support member in a secured manner when in its folded position on top of said chassis; and

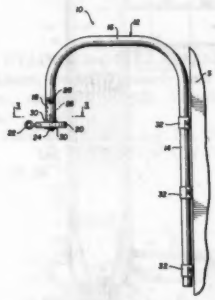
a tabletop member having one end pivotally connected to said U-shaped support member and having at least one support leg pivotally connected at one terminus to said tabletop member.

4,509,462

PET HITCHING DEVICE

Bobby L. Pickett, 3 Tuck Cir., Lemmon Valley, Nev. 89506

Filed May 17, 1984, Ser. No. 611,084
Int. Cl.³ A01K *1/04*
U.S. Cl. 119—117 **5 Claims**



1. A pet hitching device for a vertical support, comprising:

an elongated member having a generally vertically extending section that merges upwardly into a generally U-shaped upper section having a downwardly extending end portion that is shorter than said vertically extending section,

a disk member rotatably mounted on said end portion in a substantially horizontal plane,

hook means secured to said disk member and adapted to be connected to a pet leash, and

means for rotatably securing said vertically extending section to said vertical support to position said disk member a predetermined distance above the ground.

4,509,463

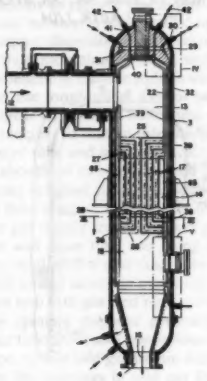
UPRIGHT APPARATUS FOR COOLING HIGH PRESSURE GASES CONTAINING A HIGH DUST CONTENT

Frohmut Vollhardt, Oberhausen, and Heinz Haacker, Kreuztal-Ferndorf, both of Fed. Rep. of Germany, assignors to M.A.N. Maschinenfabrik Ausburg-Nürnberg Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 22, 1983, Ser. No. 564,210
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1983, 3248096
Int. Cl.³ F22D *1/00*
U.S. Cl. 122—7 R **7 Claims**

1. In an upright apparatus for cooling high pressure gases containing a high dust component by radiation and convection, which apparatus is followed by a radiation cooler on the gas side, the improvement comprising a cooler housing defining a vertically elongated interior chamber with an inlet adjacent its upper end for the gas and a discharge for the gas adjacent its lower end, and at least one heat exchanger in said chamber comprising a plurality of vertical finned tube walls arranged in spaced substantially parallel rows forming gas pass lanes be-

tween said rows and extending across said chamber substantially from one side thereof to the other, and header means



associated with said rows for connecting a coolant through said tubes.

4,509,464

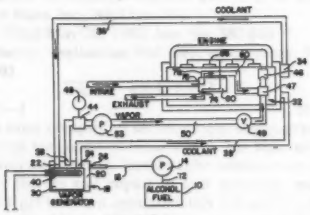
HIGH EFFICIENCY INTERNAL COMBUSTION STEAM ENGINE

Herbert N. W. Hansen, 432 Wing Park Blvd., Elgin, Ill. 60120

Continuation-in-part of Ser. No. 402,116, Jul. 26, 1982, abandoned. This application Mar. 14, 1984, Ser. No. 589,049

Int. Cl.³ F02M *25/02, 31/10*

U.S. Cl. 123—1 A **14 Claims**



1. A fuel-water system for an internal combustion steam engine adapted for use with alcohol-water mixtures, the engine including at least one cylinder having an air/fuel-water inlet and a burned fuel exhaust outlet, the engine further including a fluid engine coolant system; the fuel-water system comprising a carburetor; a reservoir adapted to contain an alcohol-water mixture; two-stage fuel-water vaporizing means having an fuel-water inlet from the reservoir and a vapor fuel-water outlet connected to the carburetor, the vaporizing means operatively connected to the engine coolant system, the vaporizing means defining a first fuel-water preheat zone and a second final fuel-water vaporizing zone above the first pre-heat zone, means for maintaining the liquid fuel-water substantially at the upper limit of the final fuel-water vaporizing zone whereby the waste engine heat transferred from the coolant system to the vaporizing means preheats the fuel-water in the first zone to a temperature less than the vaporization temperature of alcohol and heats the fuel-water in the second zone to at least the temperature of water vaporization whereby proper fuel-water vaporization occurs with minimal fractional vaporization.

4,509,465

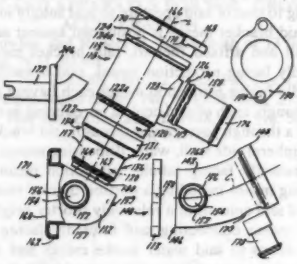
THERMOSTAT HOUSING ASSEMBLY

Karl R. Edelmann, 1468 Chestnut La., Rochester, Mich. 48063

Continuation-in-part of Ser. No. 404,463, Aug. 2, 1982, Pat. No. 4,434,750. This application Oct. 31, 1983, Ser. No. 547,003

Int. Cl.³ F01P *7/16*

U.S. Cl. 123—41.02 **28 Claims**



1. A modular thermostat housing construction for attachment to an engine comprising:

(a) base module having means for attaching to said engine and defining a first chamber for conducting fluid;

(b) thermostat receiving module having a wall defining a second chamber for conducting fluid and having an opening through said wall communicating with said second chamber; and

(c) hollow extension module assembled on said wall of said thermostat receiving module to communicate with said opening;

(d) said base module and said thermostat receiving module having interfitting means adapted for interfitting assembly and engageable to join said thermostat receiving module and said base module together in a selected one of a plurality of spatial configurations, whereby the spatial relationship of said extension module relative to said engine is determined.

12. A method of constructing a thermostat housing for an engine comprising:

(a) forming a thermostat receiving module to have a wall defining a first fluid conducting chamber communicating with a first opening;

(b) forming a second opening through said wall;

(c) attaching a hollow extension module to said wall to communicate with said second opening;

(d) forming a base module to have means for attaching to said engine and to define a second fluid conducting chamber communicating with a second opening;

(e) interfitting said base module with said thermostat receiving module so that said second opening is positioned at a preselected position relative to said base module; and

(f) attaching said base module to said thermostat receiving module.

4,509,466

DIESEL ENGINE WITH AN EFFECTIVE COMPRESSION RATIO SUBSTANTIALLY EQUAL TO THE GEOMETRICAL COMPRESSION RATIO

Luigi Bernardoni, Tradate, and Umberto Invernizzi, Milan, both of Italy, assignors to Alfa Romeo Auto S.p.A., Naples, Italy

Filed Aug. 5, 1983, Ser. No. 520,848

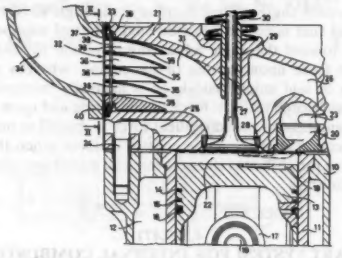
Claims priority, application Italy, Aug. 18, 1982, 22886 A/82

Int. Cl.³ F02B *77/00*

U.S. Cl. 123—52 MF **2 Claims**

1. A diesel internal combustion engine of the type having a cylinder, a piston mounted in said cylinder for reciprocating movement, an intake duct for air, and an intake valve between said cylinder and said intake duct, said intake valve having a timing means relative to the movement of said piston wherein

said intake valve is open during an initial part of a compression stroke of said piston wherein there is a back flow of intake gases during an initial part of said compression stroke which would evolve an effective compression ratio less than a calculated geometric compression ratio, and automatic non-return



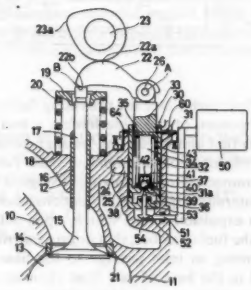
valve means within said intake duct immediately upstream of said intake valve and in series with said intake valve for restricting intake air back flow into said intake duct during said initial part of said compression stroke, said non-return valve means forming means for providing an effective compression ratio substantially equal to said geometrical compression ratio.

4,509,467

HYDRAULIC LIFTER SYSTEM FOR VARIABLE CYLINDER ENGINES

Fuminao Arai, Chiryu; Hisashi Kodama, Nagoya, and Takuro Ono, Chiryu, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 2, 1983, Ser. No. 548,100
Claims priority, application Japan, Nov. 9, 1982, 57-197367
Int. Cl.³ F02D *13/06*
U.S. Cl. 123—90.16 **6 Claims**



1. A hydraulic lifter system for variable cylinder engines comprising:

a rocker arm being capable of rocking in association with a rotation of a cam shaft and being in contact with an intake or exhaust valve,

a hydraulic lifter operatively connected to said rocker arm and including a body having a pressure chamber and a reservoir chamber therein, a plunger slidably positioned within said body and exposed to said pressure chamber and a check valve positioned between said pressure and reservoir chambers to thereby allow the fluid flow only into said pressure chamber from said reservoir chamber,

a solenoid valve positioned by the side of said hydraulic lifter and actuated in response to electric signals,

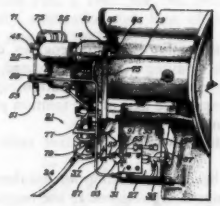
means for causing said check valve to open to thereby establish the fluid communication between said pressure and reservoir chambers by means of said solenoid valve, and a stopper member for locking said plunger to stop the operation of said hydraulic lifter in association with said means for causing said check vavle to open.

4,509,468

CYLINDER OILER ASSEMBLY

Harrold Cockburn; Darrel Weatherly, and Earl Yarbro, all of Bowie, Tex., assignors to Bell Manufacturing Company, Bowie, Tex.

Filed Jan. 3, 1984, Ser. No. 567,670
Int. Cl.³ F01M *9/10, 1/00*
U.S. Cl. 123—90.38 **5 Claims**



1. In an engine having conventional components including at least one valve, pivotally mounted rocker arm for operating said valve, reciprocally movable member for effecting pivotal movement of said rocker arm, splash system for internal lubrication of the engine and including an oil sump internally of the engine for containing oil for the splash system, the improvement consisting essentially of an external lubrication system comprising:

a. a cover for said rocker arm; said cover being sealingly emplaced about said rocker arm and having at least one oil inlet aperture to allow oil to be applied to said rocker arm at its lubrication points of contact and having at least one oil drain aperture to allow oil to drain from said cover;

b. oil reservoir for containing oil for lubricating said rocker arm; said oil reservoir being externally mounted and separate from the engine oil sump;

c. oil drain conduit connected at its one end with said oil drain aperture of said cover and at its other end with said oil reservoir for recycling oil from said cover to said oil reservoir;

d. oil pump having a suction and a discharge for pumping said oil for lubricating said rocker arm; said oil pump being mounted exteriorly of said engine and operable independently of the splash internal lubrication system;

e. oil suction conduit connected respectively with said oil reservoir and said suction of said oil pump so as to convey oil from said reservoir to said pump for being pumped to lubricate said rocker arm; said oil suction conduit being mounted exteriorly of said engine;

f. discharge oil distribution system including a plurality of conduits sealingly connected respectively with said discharge of said pump and containing a manifold for distributing the oil in said external lubrication system to a plurality of lubrication points of contact interiorly of said cover; said discharge oil distribution system being mounted exteriorly of said engine; and

g. oil pump power means for powering said oil pump; said oil pump power means being drivingly connected with a moving part of said engine so as to operate said pump and driven in response to the engine operation; said oil pump power means being disposed exteriorly of said engine.

4,509,469
BREAK IGNITION PLUG

Max Pasbrig, Orselina, Switzerland, assignor to Lacrex Brevetti S.A., Orselina, Switzerland

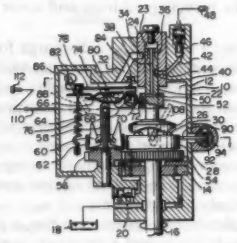
Filed Nov. 17, 1980, Ser. No. 207,455
Claims priority, application Fed. Rep. of Germany, Dec. 21, 1979, 2951848
Int. Cl.³ F02P 15/00
U.S. Cl. 123—154 6 Claims

1. A break ignition plug for piston engines, comprising:
an electromagnet having a magnet core and magnet coil;
blade springs arranged in spaced relationship from one another at a lengthwise axis of the ignition plug;
said blade springs having free ends;
electrode heads provided at the free ends of said blade springs;
said electrode heads confronting one another;
said blade springs being retained in the magnet core;
said blade springs freely protruding with the electrode heads provided at the blade spring ends into a hollow space formed at a threaded portion of the ignition plug;
armature means formed on the blade springs at a magnetic gap region of the magnet core; and
said armature means comprising armature members arranged to be repelled from one another upon excitation of the electromagnet.

4,509,470
FUEL INJECTION PUMP

Satoru Ito, and Masatoshi Endo, both of Higashi Matsuyama, Japan, assignors to Diesel Kiki Company, Ltd., Tokyo, Japan

Filed Mar. 1, 1982, Ser. No. 353,130
Claims priority, application Japan, Mar. 12, 1981, 56-34670[U]
Int. Cl.³ F02M 39/00; F02D 31/00
U.S. Cl. 123—179 L 2 Claims

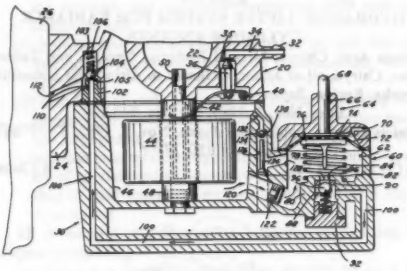


1. A fuel injection pump for an engine, comprising a fuel injection advance angle control member which is controlled to increase the angle as the speed of the engine is increased, a fuel control member which is controlled to decrease the amount of fuel injection as the engine speed is increased, a knob located in a position accessible for manipulation, an operative connection means between said knob and at least the fuel injection advance angle control member for permitting said member to be manually controlled through said knob to increase the angle before the engine is started, said operative connection means comprising reaction force reducing means for reducing the reaction force which counteracts the force exerted on said knob when manually controlling said fuel injection advance angle control member toward an angle advancing direction, said reaction force reducing means comprising a spring which yields upon manipulation of said knob prior to the start of the engine to store a resilient force therein without moving said fuel injection advance angle control member in the angle advance direction said fuel injection advance angle control member being moved toward the angle advancing direction by said stored resilient force upon starting of the engine, whereby prior to starting of said engine said knob is manually manipulated to apply said stored resilient force to said spring and upon starting of said engine said stored resilient force is applied to move said fuel injection advance angle control member when the force necessary for such movement is reduced due to said starting of the engine.

4,509,471
START SYSTEM FOR INTERNAL COMBUSTION ENGINES

William C. Eberline, Cass City, Mich.; Norman H. Radtke, Fond du Lac, Wis., and Robert L. Van Camp, Cass City, Mich., assignors to Walbro Corporation, Cass City, Mich.

Filed Jan. 7, 1983, Ser. No. 456,422
Int. Cl.³ F02N 17/00
U.S. Cl. 123—179 G 1 Claim



1. In a float carburetor for providing fuel to engines, such as outboard motors, of the type having a body forming a float chamber, a fuel and air mixing passage connected to the fuel induction chamber of an engine, a main fuel nozzle and idle passages connected to said mixing passage, a supplemental fuel chamber laterally adjacent said float chamber in the carburetor body with expulsion means which, upon actuation, will expel fuel from the fuel chamber, that improvement which comprises means forming an inlet passage to the base of said chamber connected to the base of said float chamber and an outlet air vent passage at the top of said chamber connected to the top of said float chamber, normally open, one-way valves in said passages to allow fuel to flow freely into said chamber from said float chamber and closed upon actuation of said expulsion means, means forming an auxiliary fuel passage connecting said supplemental fuel chamber to a fuel receiving portion of an internal combustion engine, a first one-way valve at the chamber end of said auxiliary passage mechanically opened by actuation of said explusion means to allow flow from said chamber to said auxiliary passage, a second normally closed, spring-biased one-way valve at the engine end of said auxiliary passage opened by pressure in said chamber and said auxiliary passage created by actuation of said expulsion means, and a third calibrated passage opening from said auxiliary passage to said engine to admit fuel to said engine when said first one-way valve is open by said expulsion means and said second one-way valve is open by said explusion means and said second one-way valve is closed.

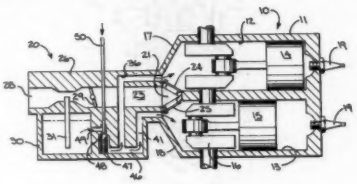
4,509,472
STARTING ENRICHMENT OF ALTERNATE FIRING TWO CYCLE INTERNAL COMBUSTION ENGINE

Gordon C. Slattery, Omro, Wis., assignor to Brunswick Corp., Skokie, Ill.

Continuation of Ser. No. 452,912, Dec. 27, 1982, abandoned. This application Jul. 26, 1984, Ser. No. 634,657

Int. Cl.³ F02N 17/00

U.S. Cl. 123—179 G 8 Claims



1. In an internal combustion engine, the combination comprising:

(a) a cylinder block having first and second pistons reciprocable in opposite directions within first and second cylinders,

(b) first and second crankcases associated with said first and second pistons,

(c) means mounted to said engine for supplying a fuel-air mixture to said first and second crankcases alternately upon reciprocation of said first and second pistons,

(d) and means responsive to pressure in each crankcase for supplying a supplemental charge of fuel alternately to said crankcases upon reciprocation of said pistons during starting of said engine, said supplemental charge supplying means operative upon reciprocation of said first piston in one direction and said second piston in the opposite direction to inject fuel into said first crankcase by the pressure developed within said second crankcase by said second piston, and upon reciprocation of said first piston in the said opposite direction and said second piston in the said one direction to inject fuel into said second crankcase by the pressure developed within said first crankcase by said first piston.

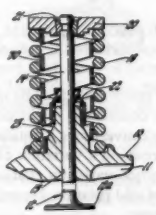
4,509,473
SPRING DAMPER WITH CONTROLLED WEAR AREA

Nshan Hamparian, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Apr. 18, 1984, Ser. No. 601,427

Int. Cl.³ F01L 3/10

U.S. Cl. 123—188 SC 3 Claims



1. In an internal combustion engine having a cylinder head, a poppet valve supported by the cylinder head for movement between valve open and valve closed positions, the poppet valve having a stem extending through a guide bore in the cylinder head, actuator means operatively associated with the poppet valve for reciprocating the poppet valve, the actuator means including a coiled valve return spring loosely encircling the stem of the valve and operatively associated at one end with the valve and its opposite bottom end in abutment against the cylinder head whereby to normally bias the poppet valve to the closed position and, a coiled valve spring damper of flat wire operatively positioned within the valve return spring for reducing spring coil resonance, the improvement wherein said valve spring damper is of reduced external diameter adjacent to the bottom of the valve return spring for an axial extent corresponding to approximately 2½ coils of said valve spring whereby to eliminate damper-to-spring contact up to at least 1½ coils of said valve return spring next adjacent to the bottom end thereof.

4,509,474
PISTON MACHINE

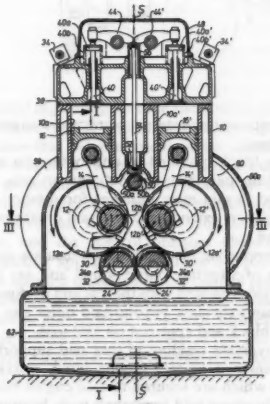
Johann Schmuck, Sternplattenweg 11, 8201 Bad Feilnbach, Fed. Rep. of Germany

Filed Feb. 4, 1982, Ser. No. 345,831

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109778; Aug. 18, 1981, 3132502

Int. Cl.³ F16F 15/24

U.S. Cl. 123—192 B 21 Claims



1. In a piston machine assembly which includes at least one piston machine having:

two similar, rotatably supported, parallel crankshafts which are each operatively coupled to a respective piston, said crankshafts being driven synchronously with one another, and said pistons and crankshafts forming a working unit;

two rotatably supported balance shafts which are each associated with an extend approximately parallel to a respective said crankshaft;

counterweights of equal mass supported on said crankshafts and balance weights of equal mass supported on said balance shafts, said crankshafts, said pistons, said balance shafts, said counterweights and said balance weights being arranged in mirror-image fashion relative to a plane of symmetry which extends parallel to and is disposed intermediate said crankshafts and said balance shafts; and

coupling means for operatively rotationally coupling said crankshafts and said balance shafts;

the improvement comprising wherein:

said coupling means is adapted to cause said crankshafts to rotate synchronously with one another but in opposite directions; and

each of said balance shafts is disposed adjacent to and is driven through said coupling means by the associated crankshaft in a rotatable direction which is opposite to that of and at a speed which is twice that of the associated crankshaft, first and second order forces produced by

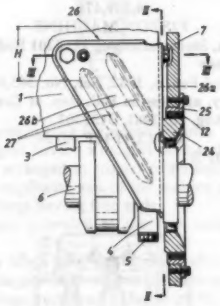
rotating and oscillating elements of said piston machine being fully balanced by forces produced by said counterweights and said balance weights.

4,509,475

RECIPROCATING INTERNAL COMBUSTION ENGINE

Tomas Visek, Steyr, Austria, assignor to Steyr-Daimler-Puch Aktiengesellschaft, Vienna, Austria

Filed Feb. 28, 1984, Ser. No. 584,487
Claims priority, application Austria, Mar. 3, 1983, 730/83
Int. Cl.³ F16M *1/02*
U.S. Cl. 123—195 A **8 Claims**



1. In a reciprocating internal combustion engine comprising an outer pan,

an engine block mounted in said outer pan and including crankshaft main bearings defining an axis, a crankshaft mounted in said main bearings for rotation on said axis, and cylinders extending above said crankshaft main bearings, and

annular supporting elements which insulate against a transmission of structure-borne sound and are adjacent said engine block at both ends thereof and disposed within said outer pan extending beyond said outer pan towards said engine block and centered on said axis,

the improvement residing in that said supporting elements are connected to said engine block solely by holding means, which are secured to said engine block only substantially above said crankshaft main bearings.

4,509,476

SPARK-PLUG ASSEMBLY FOR INTERNAL-COMBUSTION ENGINE

Erich Breuser; Wilhelm Grözinger; Reinhard Latsch, all of Vaihingen, and Gernot Würfel, Sinsheim, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 540,605
Claims priority, application Fed. Rep. of Germany, Nov. 11, 1982, 3241697
Int. Cl.³ F02B *19/08*
U.S. Cl. 123—266 **18 Claims**

1. In combination with an internal-combustion engine having a piston cylinder, a wall covering the piston cylinder and delimiting therewith a combustion chamber, and a spark-plug assembly comprising:

a fitting mounted in said wall and formed with a generally closed firing chamber;

a spark plug having electrodes in the firing chamber;

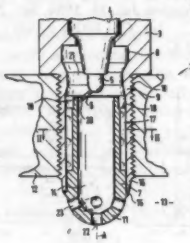
the fitting including

an outer part carrying the spark plug and forming a normally upper portion of the firing chamber, and

an electrically conductive insert forming a normally lower portion of the firing chamber;

at least one firing port extending between the lower portion of the firing chamber and the combustion chamber for fluid communication therebetween;

at least one storage compartment arranged between the outer part and the insert and opening only into the upper portion of the firing chamber, the fitting being provided



with means preventing the entrance of a flame front from the firing chamber into the storage compartment; the electrodes forming a spark gap lying in the firing chamber between the upper and lower portions thereof; and

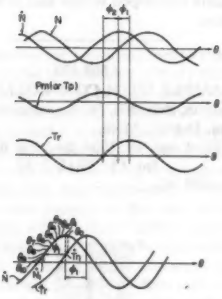
the electrically conductive insert being one of said electrodes.

4,509,477

IDLE OPERATION CONTROL FOR INTERNAL COMBUSTION ENGINES

Mitsunori Takao, Kariya, and Takahiko Kimura, Nagoya, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 18, 1983, Ser. No. 553,295
Int. Cl.² F02P *5/04*; F02B *3/00*
U.S. Cl. 123—339 **8 Claims**



1. A method for controlling the idle operation of an internal combustion engine comprising the steps of:

detecting at successive times a rotational speed of said engine and determining a variation characteristic thereof;

determining a torque variation characteristic of said engine as a function of said rotational speed variation characteristic of said engine;

determining a phase difference between said rotational speed variation and torque variation characteristics as a function of said engine rotational speed;

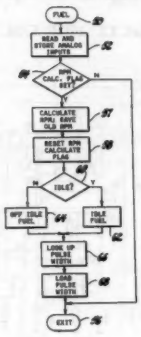
determining a present value of engine torque variation as a function of said torque variation characteristic; and

controlling at least one engine operation parameter in a direction to minimize said engine torque variation.

4,509,478
ENGINE FUEL CONTROL SYSTEM

Frank Ament, Rochester; Richard A. Peden, Livonia, and John E. Ausen, Flint, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 11, 1984, Ser. No. 619,476
Int. Cl.³ F02B 32/00
U.S. Cl. 123—339 2 Claims



1. A fuel control system for an internal combustion engine having a fuel delivery means for supplying fuel to the engine, the fuel control system comprising:

means for sensing the idle and off-idle operating states of the engine;

means for sensing the engine speed;

means for scheduling an off-idle fuel quantity in accord with predetermined engine operating parameters during the off-idle operating state of the engine;

means for scheduling an idle fuel quantity in accord with the engine speed during the idle operating state of the engine;

means for controlling the fuel delivery means to supply the scheduled idle and off-idle fuel quantities during the respective idle and off-idle operating states of the engine;

means responsive to the sensed engine speed during the idle operating state of the engine for adjusting the scheduled idle fuel quantity by an amount to obtain a desired engine idle speed; and

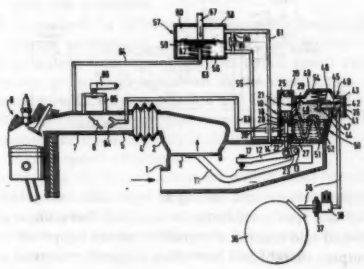
means for progressively adjusting the scheduled off-idle fuel quantity between 0 and 100 percent of the prior idle fuel adjustment amount in an inverse relationship to engine speed over a predetermined speed range in proximity to the desired engine idle speed, whereby the progressive variation in the off-idle fuel quantity value provides a smooth transition between the idle and off-idle operating states of the engine.

4,509,479
APPARATUS FOR AIR-INJECTION OF LIQUID GAS

Rudolf C. Rijkeboer, Voorburg, Netherlands, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 11, 1984, Ser. No. 569,867
Claims priority, application Fed. Rep. of Germany, Apr. 9, 1983, 3312760
Int. Cl.³ F02M 21/02, 39/00
U.S. Cl. 123—525 7 Claims

1. An apparatus for air-injection of liquid gas into an intake tube of an internal combustion engine comprising a vaporizer pressure regulating valve, which has a yielding wall, and a movable valve element, said movable valve element of the vaporizer pressure regulating valve being actuatable by said yielding wall which is engaged on one side by the pressure of the vaporized liquid gas and a compression spring, and on the other side with the atmosphere, and a metering valve including a metering valve element disposed downstream of the vaporizer pressure regulating valve, the valve element of said metering valve is embodied as a metering piston and actuated by an air flow rate meter measuring the air throughput in intake tube upstream of a throttle valve, said metering valve opens a metering cross section for the gaseous fuel to a greater or lesser extent toward an air-injection line leading to the intake tube and can be acted upon on one side by the pressure of the vaporized liquid gas in the varporizer pressure regulating valve and on the other side by the air flow rate meter and by the air flow rate meter and by a pneumatic counterpressure medium, and said metering piston is remote from the air flow rate meter and has a control face which on one side defines a control chamber communicating with a control pressure line by which the pressure in said control chamber is regulated by



a pressure control regulating valve in the control pressure line, of a control air serving as a pneumatic counter-pressure medium, and a movable valve element of the control pressure regulating valve opens a valve seat disposed in a control pressure chamber communicating with the control pressure line, to a greater or lesser extent, from which a negative-pressure line leads from a valve seat to the intake tube downstream of a throttle valve, and the control pressure chamber includes therein a regulating spring which urges the movable valve element in the opening direction of the control pressure regulating valve toward a high-pressure chamber communicating via a high-pressure line with the intake tube upstream of the air flow rate meter, wherein the high-pressure line and the control pressure line are connected via a throttle restriction.

4,509,480
SAFETY ARRANGEMENT FOR AN INTERNAL COMBUSTION ENGINE

Hermann Kull, Stuttgart; Wolf Wessel, Oberriexingen, and Gerhard Stumpp, Stuttgart, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 17, 1984, Ser. No. 571,475
Claims priority, application Fed. Rep. of Germany, Jan. 20, 1983, 3301743
Int. Cl.³ F02D 31/00
U.S. Cl. 123—359 6 Claims

1. A safety arrangement for a self-igniting internal combustion engine such as a diesel engine or the like for a motor vehicle wherein the engine includes: throttle means and fuel injection means for injecting fuel into the engine; the safety arrangement comprising:

first sensor means for providing an electrical signal N indicative of the rotational speed (rpm) of the engine;

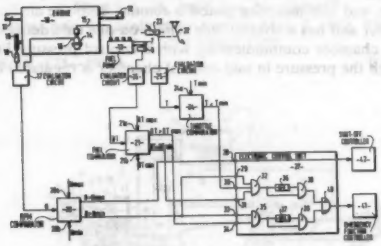
second sensor means for providing an electrical signal RT indicative of the quantity of fuel injected;

third sensor means for providing an electrical signal T indicative of the position of said throttle means;

rpm comparator means for monitoring said rpm signal N and comparing the same to a lower limit value N_{min} and an upper limit value N_{max} thereof and generating a signal indicative of the comparison;

fuel comparator means for monitoring said fuel-quantity signal RT and comparing the same to a lower limit value RT_{min} and a higher limit value RT_{max} thereof and generating a signal indicative of the comparison;

throttle comparator means for monitoring said throttle means position signal T and comparing the same to a lower limit value T_{min} and generating a signal indicative of the comparison; and,



an electronic control unit having an input side connected to each of said rpm comparator means, said fuel comparator means and said throttle comparator means for processing the outputs thereof and providing respective control signals in dependence upon and as required by conditions in the engine as evaluated from said outputs of said respective comparator means.

4,509,481

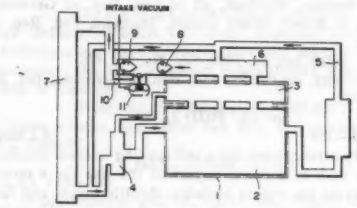
INTERNAL COMBUSTION ENGINE WITH COOLING SYSTEM

Shinichi Nagumo, Yokohama; Hiromichi Ofuji, Yokosuka, and Kazuyuki Miisho, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jan. 25, 1984, Ser. No. 573,724

Int. Cl.³ F02P *5/04;* **F01P** *7/14*

U.S. Cl. 123—407 **18 Claims**



1. An internal combustion engine having a radiator and coolant jackets, comprising:

means for varying the amount of engine coolant introduced from the coolant jackets to the radiator in accordance with engine load; and

ignition timing control means for retarding an ignition timing relative to a predetermined ignition timing only for a time period immediatly after engine operation is shifted to a high engine load mode.

4,509,482

ELECTRONICALLY CONTROLLED IGNITION SYSTEM

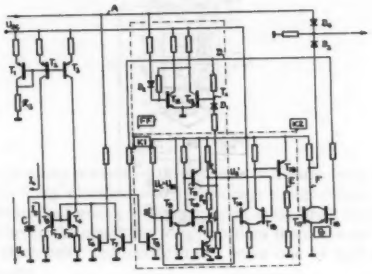
Willy Minner, Schwaigern; Alfred Krappel, Ismaning, and Johannes Guggenmos, Dirlewang, all of Fed. Rep. of Germany, assignors to Telefunken Electronic GmbH, Heilbronn and Bayerische Motoren Werke AG, Munich, both of, Fed. Rep. of Germany

Filed Sep. 2, 1982, Ser. No. 415,704

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1981, 3134883

Int. Cl.³ F02P *5/04*

U.S. Cl. 123—418 **17 Claims**



1. An electronically controlled ignition system for an internal combustion engine comprising an ignition pulse sensor, control signal generating means producing a square wave control signal in dependence on said sensor, and means connected to receive the control signal for producing a saw-tooth signal in each cycle of the square wave control signal, the saw-tooth signal having a slow rising flank and a rapid falling flank and being derived from only one flank of the control signal and the relationship of the gradients of the two flanks of said saw-tooth signal being a measure for the change necessary in the control signal to produce a corrected control signal.

4,509,483

FUEL INJECTION APPARATUS AND SYSTEM

Kalin S. Johnson, Northville, Mich., assignor to Colt Industries Operating Corp, New York, N.Y.

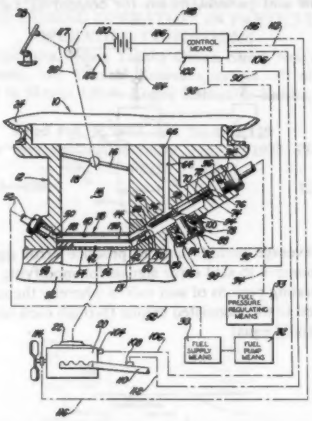
Filed Jan. 24, 1984, Ser. No. 573,336

Int. Cl.³ F02M *32/00, 7/24;* **F02B** *75/18*

U.S. Cl. 123—432 **14 Claims**

1. Fuel injection apparatus and system for a combustion engine, comprising throttle body means, induction passage means formed through said throttle body means, throttle valve means for controlling the flow of induction air through said induction passage means, an associated source of fuel, metered fuel discharge nozzle means for discharging metered fuel into said flow of induction air through said induction passage means, said metered fuel discharge nozzle means comprising first fuel inlet means, fuel return passage means for operative communication with said associated source of fuel, said fuel return passage means comprising second fuel inlet means, fuel discharge orifice means, means for providing a supply of fuel under regulated superatmospheric pressure to said fuel discharge orifice means as to be discharged therethrough, and means responsive to indicia of engine operation for causing a first portion of said fuel as is discharged from said discharge orifice means to flow into said second inlet means and through said fuel return passage means and causing a second portion of said fuel as is discharged from said discharge orifice means to flow into said first inlet means and be discharged by said metered fuel discharge nozzle means into said flow of induction air, said second portion of said fuel as is discharged into said flow of induction air determining the rate of metered fuel flow being supplied to said engine, said means responsive to indicia

of engine operation being effective to vary the relative proportion of said first portion compared to said second portion as to



thereby vary the rate of said metered fuel flow in accordance with engine operating conditions.

4,509,484

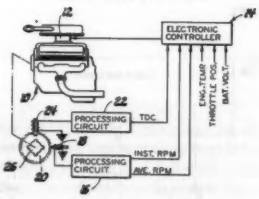
CLOSED LOOP LEAN AIR/FUEL RATIO CONTROLLER

Kevin M. Gertiser, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 16, 1983, Ser. No. 494,938

Int. Cl.³ F02M 7/10

U.S. Cl. 123—436 **4 Claims**



1. For an internal combustion engine having combustion chambers and an output shaft that undergoes cyclic speed variations in response to the pressure variations in the combustion chambers representative of engine operating roughness, a system for controlling the air-fuel mixture supplied to the engine to a lean limit resulting in a maximum desired engine operating roughness, the engine tending to increase its operating roughness at engine idle conditions so that the air-fuel mixture resulting in the maximum engine operating roughness is substantially richer during an engine idle condition, the system comprising:

means effective to sense the instantaneous speed of the output shaft;

means responsive to the sensed output shaft speed effective to generate a roughness signal indicative of the roughness of the engine's operation;

means effective to generate a roughness reference signal representing the maximum desired engine roughness;

means effective to increase the air/fuel ratio of the mixture supplied to the engine at a first predetermined rate when the roughness signal is less than the roughness reference signal and to decrease the air/fuel ratio of the mixture at a second predetermined rate when the roughness signal is greater than the roughness reference signal, the air/fuel ratio at which the roughness signal is equal to the roughness reference signal comprising the lean limit of the air fuel-mixture;

means effective to sense an engine idle condition; and

means responsive to a sensed engine idle condition effective to shift the roughness reference signal by a predetermined value representing a predetermined increase in the engine roughness level and decrease the rate of increase in the air/fuel ratio from the first predetermined rate to a third predetermined rate, whereby the fuel economy of the internal combustion engine is maximized by increasing the allowable engine roughness and accordingly the lean limit of the air/fuel ratio supplied to the engine during an engine idle condition.

2. A method for detecting the operating roughness level of an internal combustion engine having combustion chambers and an output shaft that undergoes cyclic speed variations in response to pressure variations in the combustion chambers associated with the compression and combustion in each combustion chamber, the method comprising the steps of:

sensing the minimum output shaft speed of each cycle of the cyclic speed variations;

averaging the sensed minimum output shaft speeds; and

taking the difference between the sensed minimum output shaft speed and the average of the sensed minimum output shaft speeds, the difference being an indication of the operating roughness level of the engine.

4,509,485

METHOD AND DEVICE FOR BACK PRESSURE-DEPENDENT CORRECTION OF AIR/FUEL RATIO FOR INTERNAL COMBUSTION ENGINES

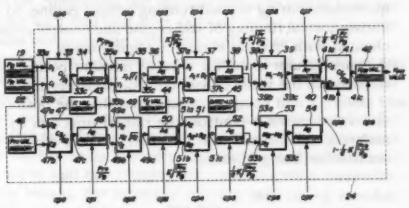
Shumpei Hasegawa, Niiza, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 17, 1982, Ser. No. 442,505

Claims priority, application Japan, Nov. 18, 1981, 56-184985

Int. Cl.³ F02B 3/00

U.S. Cl. 123—440 **7 Claims**



1. A method for correcting the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine having an exhaust pipe, an intake pipe, and a throttle valve arranged in said intake pipe, comprising: detecting a value of at least one parameter indicative of the operating condition of said engine; determining a value of the air/fuel ratio of said air/fuel mixture in accordance with the detected value of said at least one parameter; detecting a value of absolute pressure in said exhaust pipe; detecting a value of absolute pressure in said intake pipe at a location downstream of said throttle valve; determining a value of a coefficient for correction of said determined value of the air/fuel ratio, as a function of the detected values of said exhaust pipe absolute pressure, said intake pipe absolute pressure, and a predetermined reference value of said exhaust pipe absolute pressure which is available at a predetermined value of atmospheric pressure provided that said engine is not provided with any element which increases said exhaust pipe absolute pressure; and correcting the determined value of the air/fuel ratio by an amount corre-

sponding to the determined value of said correction coefficient.

4,509,486

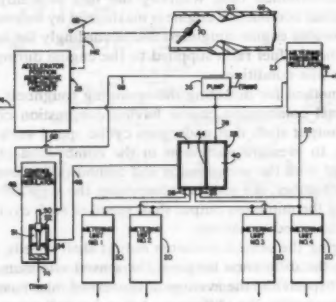
CONTINUOUS FLOW FUEL INJECTION SYSTEM

Joseph E. Swift, 47 Highview Rd., South Windsor, Conn. 06074

Filed Apr. 29, 1983, Ser. No. 489,792

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—453 **16 Claims**



1. A continuous flow fuel injection system for an internal combustion engine having at least one combustion zone, said system comprising:

a metering unit for continuously injecting fuel into the air induction path for said one combustion zone,

means for supplying injection fuel at a pressure which remains substantially constant for all operating conditions of the engine to said metering unit for said injection at said substantially constant pressure into said air induction path, and

means for supplying control fuel to said metering unit independently of said supply of injection fuel and at a control pressure the value of which is dependent on engine requirements during normal running of said engine, so that during normal running of said engine said control pressure changes with changes in engine requirements,

said metering unit including a valve member positioned in response to the value of said control pressure, and

said metering unit being so constructed that the position of said valve member controls the rate of injection by said metering unit of said injection fuel without any of said control fuel being injected.

4,509,487

FUEL SYSTEM FOR MULTI-CYLINDER ENGINE

Dorian F. Mowbray, Burnham, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

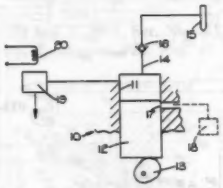
Continuation of Ser. No. 451,855, Dec. 21, 1982, abandoned. This application Oct. 24, 1984, Ser. No. 664,109

Claims priority, application United Kingdom, Dec. 24, 1981, 8138931

Int. Cl.³ F02M *39/00*

U.S. Cl. 123—458 **2 Claims**

1. Fuel system for a multi cylinder compression ignition engine comprising a plurality of injection pumps for delivering fuel to the injection nozzles of the engine respectively, a cam shaft for operating said pumps said cam shaft being driven in use by the associated engine, a plurality of electrically operated valves associated with the pumps respectively, said valves being operable to ensure the supply of fuel by the associated pumps to the injection nozzles, control circuit means for controlling the operation of said valves whereby the operating periods of said valves and hence the amount of fuel delivered by the pumps can be controlled in accordance with desired and actual engine operating parameters, transducer means for providing a pulse signal at each working stroke of the engine, means for measuring the period between successive pulse signals, means for producing an average period value from a plurality of said periods, means for comparing each period



with said average period value to produce error signals and means responsive to said error signals for modifying the individual operating periods of said valves whereby the amount of fuel supplied to the associated engine through each nozzle will be substantially equal.

4,509,488

PROCESS AND APPARATUS FOR INTERMITTENT CONTROL OF A CYCLICALLY OPERATING INTERNAL COMBUSTION ENGINE

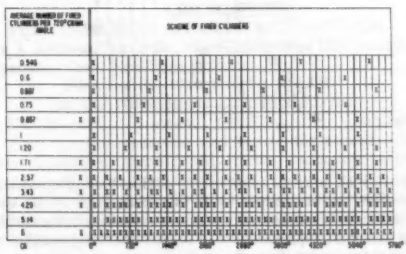
Hans-Joachim Förster, Stuttgart; Bernd-Eric Lübbing, Winterbach, and Ulrich Letsche, Stuttgart, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Fed. Rep. of Germany

Filed Jul. 12, 1982, Ser. No. 397,045

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3129078

Int. Cl.³ F02D *73/06*

U.S. Cl. 123—481 **4 Claims**



1. A process for intermittent control of a cyclically operating internal combustion engine having plural working chambers, the steps comprising:

skipping working strokes in the succession of working cycles;

distributing the skipped working strokes stochastically among the various working chambers;

distributing the skipped working strokes approximately uniformly in time;

varying the number of skipped working strokes in dependence on the load and independently of the number of revolutions; and

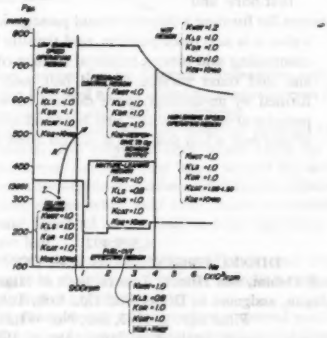
feeding fuel in a controlled fashion only respectively to the nonskipped working chambers of the internal combustion engine independently of the load in a constant amount per working stroke.

4,509,489

FUEL SUPPLY CONTROL METHOD FOR AN INTERNAL COMBUSTION ENGINE, ADAPTED TO IMPROVE OPERATIONAL STABILITY, ETC., OF THE ENGINE DURING OPERATION IN PARTICULAR OPERATING CONDITIONS

Shumpei Hasegawa, Niiza; Yutaka Otobe, Shiki; Noriyuki Kishi, Itabashi, and Takashi Koumura, Iruma, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 8, 1983, Ser. No. 502,129
Claims priority, application Japan, Jun. 11, 1982, 57-100440
Int. Cl.³ F02M 51/00
U.S. Cl. 123—489 12 Claims



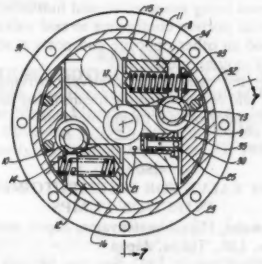
1. A method for electronically controlling the air/fuel ratio of an air/fuel mixture being supplied to an internal combustion engine having an intake passage, and a throttle valve arranged in said intake passage, in response to an output from means for detecting the concentration of an ingredient in exhaust gases emitted from said engine, the method comprising the steps of: (1) determining an operating region in which said engine is operating, including a feedback control region and a plurality of predetermined particular operating regions other than said feedback control region; (2) applying a first coefficient which is variable in value in response to the output from said exhaust gas ingredient concentration detecting means, for controlling the air/fuel ratio of the air/fuel mixture, and simultaneously determining a mean value of values of said first coefficient applied during the same air/fuel ratio control, for use as a second coefficient, when it is determined in the step (1) that said engine is operating in said feedback control region; (3) applying said second coefficient in place of said first coefficient for controlling the air/fuel ratio of the air/fuel mixture, when it is determined in the step (1) that said engine is operating in a first one of said predetermined particular operating regions; and (4) applying a predetermined value in place of said first coefficient, for controlling the air/fuel ratio of the air/fuel mixture, when it is determined in the step (1) that said engine is operating in a second one of said predetermined particular operating regions other than said first one predetermined particular operating region.

4,509,490

BUILT-IN HYDRAULIC AUTOMATIC DEVICE FOR ADVANCING THE INJECTION OF A DIESEL ENGINE

Rene' Morin, Pelussin, France, assignor to Renault Vehicules Industriels, France

Continuation of Ser. No. 107,882, Dec. 28, 1979, Pat. No. 4,401,088. This application Jul. 19, 1982, Ser. No. 399,660
Claims priority, application France, Dec. 29, 1978, 78 37109
The portion of the term of this patent subsequent to Aug. 30, 2000, has been disclaimed.
Int. Cl.³ F02M 59/20; F02D 5/00
U.S. Cl. 123—502 4 Claims



1. An automatic device for advancing the fuel injection pump of a diesel engine in response to engine speed, said fuel injection pump having a camshaft with a first central axis, said automatic device comprising:

a hub member having a second central axis substantially aligned with said first central axis of said camshaft of said fuel injection pump;

at least one cavity in said hub member, said at least one cavity having a third central axis spaced a predetermined distance from said second central axis of said hub member;

passage means in said hub member, said passage means having an inlet and an outlet;

means for connecting said passage means to said at least one cavity such that said inlet and said outlet of said passage means communicate with said at least one cavity;

a casing member rotatably mounted to said hub member, said casing member further surrounding a portion of said hub member;

at least one roller member fixed to said casing member for rotative movement therewith, said at least one roller member further being partially disposed in said at least one cavity of said hub member for communication therewith;

moving means, for rotatably moving said casing member relative to said hub member, said moving means being mounted in said at least one cavity in spaced relationship to said at least one roller member and contacting said at least one roller member such that linear movement of said moving means rotates said at least one roller member about said second central axis of said hub member; said moving means for rotatably moving said casing further comprising:

(a) at least one piston member movably disposed in said at least one cavity, said at least one piston member having one end engageable with said at least one roller member and an other end opposite said one end;

(b) displacement means for displacing said piston member against said at least one roller member such as to displace said at least one roller member in order to advance said fuel injection pump of said diesel engine, said displacement means being responsive to said engine speed;

valve distribution means mounted in said passage means for terminating communication between said at least one cavity and said outlet of said passage means; said valve distribution means further comprising:

(a) a second cavity located in said hub member, said second

cavity having a fourth central axis parallel to said third central axis;

(b) cap means mounted in said second cavity, said cap means having a central aperture and a plurality of radial holes, each of said plurality of radial holes providing flow communication between said central aperture and said second cavity; and

(c) slide means movably disposed in said central aperture, said slide means having passageway means selectively communicating said plurality of radial holes with said outlet to regulate the pressure in said second cavity;

centrifugal displacement means, for centrifugally displacing said valve distribution means, said centrifugal displacement means being mounted to said hub member and having one end portion contiguous to said valve distribution means and an other opposite end portion adapted to engage said moving means; and

rotative driving means, for rotatively driving said casing member, said rotative driving means being mounted to the outer periphery of said casing member.

4,509,491

OVERFLOW VALVE FOR DISTRIBUTOR-TYPE FUEL INJECTION PUMPS

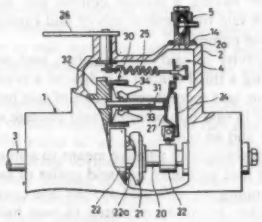
Hisatsugu Kawatei, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Nov. 2, 1983, Ser. No. 547,949

Claims priority, application Japan, Nov. 9, 1982, 57-168651[U]

Int. Cl.³ F02M *59/20*

U.S. Cl. 123—502 **2 Claims**



1. In a distributor-type fuel injection pump for an internal combustion engine, having a suction chamber filled with fuel, said fuel being variable in pressure as a function of the rotational speed of said engine, and a timing device operable in response to the pressure of said fuel within said suction chamber for advancing the fuel injection timing of said fuel injection pump with an increase in the pressure of said fuel within said suction chamber,

an overflow valve for returning excess fuel from said suction chamber to a zone under lower pressure of said fuel injection pump, said overflow valve comprising:

a passage having one end communicating with said suction chamber and another end communicating with said lower pressure zone, said passage including:

a first bore having an inner peripheral surface and an inner diameter; and

a second bore having one end opening in said first bore concentrically therewith and another end communicating with said suction chamber, said second bore having a diameter much smaller than that of said first bore;

a check valve arranged within said passage and responsive to the pressure of said fuel within said suction chamber for closing and opening said passage, said check valve having a valve body having a pressure-applying surface on which the pressure of said fuel within said suction chamber acts in a direction of opening said check valve, said pressure-applying surface assuming a first surface area when said check valve is in a closed position, and assuming a second surface area larger than said first surface area when said check valve is an open position, said check valve comprising:

a ball forming said valve body, said ball being movably received within said first bore of said passage and disposed to be liftably seated on said one end of said second bore of said passage for closing same, said ball having a diameter much larger than the diameter of said one end of said second bore; and

a spring urging said ball toward said one end of said second bore;

said ball of said check valve having said pressure-applying surface, said pressure-applying surface assuming said first surface area when said ball is in a seated position closing said one end of said second bore, and assuming said second surface area when said ball is a lifted position opening said one end of said second bore;

said ball having an outer surface and having an outer diameter slightly smaller than the inner diameter of said first bore; and

means for forming a throttle in said passage when said check valve is in said open position, said throttle forming means comprising said inner peripheral surface of said first bore and said outer surface of said ball, said throttle being formed by an annular space defined between said inner peripheral surface of said first bore and said outer surface of said ball when said ball is in said lifted position.

4,509,492

DIESEL ENGINE WITH EGR CONTROL

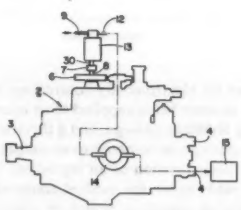
Kouji Ochiai, and Hitoshi Tomita, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Apr. 1, 1983, Ser. No. 481,372

Claims priority, application Japan, Apr. 6, 1982, 57-49567

Int. Cl.³ F02M *25/06*

U.S. Cl. 123—569 **9 Claims**



1. Diesel engine apparatus comprising:

a load responsive means providing a load mechanical output dependent on the load on the engine;

a source of vacuum pressure;

a load pressure converter communicating with said source and coupled to said load responsive means, said load pressure converter providing a load vacuum pressure level dependent on said load mechanical output;

a speed responsive means providing a speed mechanical output dependent on the revolution rate of the engine;

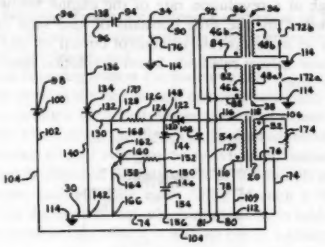
a speed pressure converter communicating with said load pressure converter and coupled to said speed responsive means, said speed pressure converter providing an output vacuum pressure level dependent on said load vacuum pressure level and said speed mechanical output; and

an EGR control valve for regulating the flow of gases between the exhaust and the intake of the engine in response to said output vacuum pressure level.

4,509,493
SMALL ENGINE IGNITION SYSTEM WITH SPARK ADVANCE

Donald R. Nash, Berkey, Ohio, assignor to Allied Corporation, Morristown, N.J.

Filed Jun. 13, 1984, Ser. No. 619,979
Int. Cl.³ F02P *3/08, 3/06*
U.S. Cl. 123—602 **10 Claims**



1. An ignition system for an internal combustion engine having a rotatable flywheel means including magnet means for providing a rotating magnetic field, comprising:

a magnetic core means adapted to be mounted adjacent said flywheel means, said magnetic core means being an E-shaped core means having a first leg, a second leg and a third leg, each said leg having a free end disposed adjacent said flywheel means when said core means is mounted adjacent said flywheel means, said second leg being an intermediate leg;

a plurality of electrical windings disposed about said intermediate leg, said plurality of windings including a charging winding and a trigger winding;

a voltage waveform having a first portion, a second portion and a third portion being cyclically induced in said plurality of coils by said rotating magnetic field, said first portion and said third portion having a first polarity and said second portion having a second polarity, said second portion being temporally intermediate said first and third portions;

ignition coil means for providing an ignition impulse to said internal combustion engine; energy storage means for providing energy to said ignition coil means operably connected to and cyclically charged by said charging winding in response to said second portion of said voltage waveform;

switching means operably interposed between said ignition coil means and said energy storage means, said switching means being responsive to a predetermined voltage of said first and third portions of said voltage waveform for discharging said energy storage means into said ignition coil means to provide said ignition impulse;

said switching means having a first input terminal for controlling said switching means;

a shunting means connected to said first input terminal for shunting a trigger signal provided by said trigger winding to said first input terminal, said trigger winding being operably connected to said first input terminal and to said shunting means;

said shunting means being resistively connected to a second energy storage means;

said second energy storage means being operatively connected to said trigger winding and being cyclically charged thereby;

said shunting means having a threshold voltage and being rendered conductive when the voltage upon said second energy storage means exceeds a predetermined value;

said second energy storage means being cyclically at least partially discharged through said shunting means;

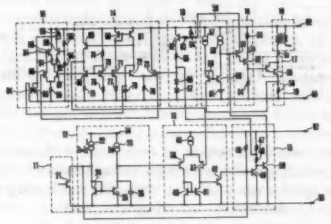
said second energy storage means being maintained at a voltage below said threshold voltage when said engine is operated below a predetermined rotational speed, said ignition impulse being provided during one said third portion, said shunting means being nonconductive;

said second energy storage means being maintained at a voltage above said threshold voltage during said second and third portions when said engine is operated above said predetermined rotational speed, said ignition impulse being provided during said first portion to provide an advanced ignition impulse, said shunting means being conductive during said second and third portions of a first said cyclically induced voltage waveform and becoming nonconductive between said first waveform and a second said waveform.

4,509,494
PULSE WIDTH CONTROL CIRCUIT

Shigeo Nishitoba, and Hirokazu Fukaya, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Japan

Filed Jun. 9, 1982, Ser. No. 386,489
Claims priority, application Japan, Jun. 12, 1981, 56-90240
Int. Cl.³ F02P *9/00*
U.S. Cl. 123—609 **5 Claims**



2. A pulse width control circuit comprising:

pulse generator means responsive to an input signal for generating a pulse signal;

output generator means for generating an output signal in response to said pulse signal;

means responsive to the current of said output signal equaling a predetermined value for generating a current detection signal;

first feedback loop means connected to said output generator means for controlling the magnitude of the current of said output signal in response to said current detection signal;

means for generating a voltage detection signal in response to the voltage applied to at least said output generator means exceeding a predetermined value; and

second feedback loop means connected to said pulse generator means for controlling the pulse width of said pulse signal in response to said voltage detection signal and thereby controlling the pulse width of said output signal.

4,509,495
IGNITION COIL FOR A MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Dieter Betz, Vaihingen, and Jörg Issler, Stuttgart, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 6, 1984, Ser. No. 577,264
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314410
Int. Cl.³ F02P *1/00*
U.S. Cl. 123—643 **10 Claims**

1. Ignition coil system, for a distributor-less ignition system of a multi-cylinder internal combustion engine having

a crankshaft (CS);

a plurality of spark plugs (10, 11, 23, 24), one each being associated with a cylinder of the engine;

a battery (2); and

at least two interruptor switches (8,27) controlled for timed opening and closing, in synchronism with rotation of the the crankshaft;

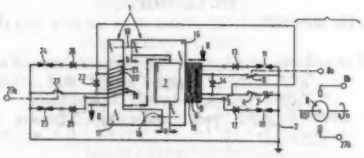
wherein the ignition coil system has

at least two winding groups (7, 19, 32, 33), each winding group including

a primary winding (6, 20) and a secondary winding (9, 21), the primary winding of each winding group being connected to the battery (2) through an associated interruptor switch (8, 27) and

a magnetic circuit (16, 17, a, b; 28, 29, 30, 31, c) coupling the primary and secondary windings of any one group, said magnetic circuit comprising iron core portions (16, 17, 28, 29), and interruption portions (a, b, c) of magnetic flux conductivity which is poor with respect to the flux conductivity of the iron core portion,

the winding groups being so located and wound on the magnetic core portions that, upon interruption of current flow from the battery by the respective interruptor switch through any one primary winding, only that one of the



secondary windings which is associated with said one primary winding will have a high voltage induced therein to cause spark-over of the at least one spark plug connected to the associated secondary coil, and

wherein, in accordance with the invention,

each one of the winding groups (7, 19; 32, 33) has its respective primary winding (6, 20) and the respective secondary winding (9, 21) wound on an individual core portion (16, 17; 28, 29) common to the respective primary and secondary windings, said core portions associated with any one winding group being coupled to core portions of another winding group by said interruption portion (a, b, c), and the distance between the primary and secondary winding on any one core portion is small with respect to the distance between the winding groups, and

wherein the core portions, on which the winding groups are wound, form essentially straight core elements (28, 29);

the core elements are connected by an iron yoke (30) at one end; and

a cross yoke (31) is provided, spaced from the other end of the core elements by the said interruption portions (c).

4,509,496

IGNITION CIRCUIT FOR INTERNAL COMBUSTION ENGINE HAVING ALTERNATELY OPERABLE HIGH AND LOW SPEED CONTROL DEVICES

Shigetoshi Ishida, Narashino, Japan, assignor to Tanaka Kogyo Company, Ltd., Narashino, Japan

Filed Nov. 22, 1982, Ser. No. 452,210

Claims priority, application Japan, Dec. 29, 1981, 56-193830[U]

Int. Cl.³ F02P *5/00*

U.S. Cl. 123—651 **8 Claims**

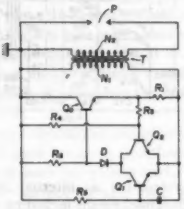
1. In an ignition circuit for an internal combustion engine where a primary current passing through a primary winding is abruptly interrupted by cut-off of a power transistor to thereby cause spark discharge of the ignition plug connected to a secondary winding of said ignition coil,

the improvement comprising:

a time constant circuit which includes a resistor (R_5) coupled to capacitor (C), said time constant circuit being coupled to said primary winding so that a portion of the primary current flows therethrough to charge said capacitor;

first and second control transistors (Q_1, Q_2) coupled to said power transistor and to said time constant circuit,

said first control transistor (Q_1) being arranged to become conductive prior to said second control transistor responsive to the electrical charge of said capacitor (C) due to said flow of said portion of said primary current therethrough at a revolution rate of the engine below a rate determined by the time constant of said time constant circuit so as to operate to control cut-off of said power transistor only at relatively lower revolution rates of said engine; and



said second control transistor (Q_2) being arranged to become conductive prior to said first control transistor when said electrical charge on said capacitor exceeds a predetermined value so as to operate to control cut-off of said power transistor only at relatively higher revolution rates exceeding said relatively lower revolution rates of the engine, said first control transistor being inoperative to cut-off said power transistor at said relatively higher revolution rates of said engine, and said second control transistor being inoperative to cut-off said power transistor at said relatively lower revolution rates of said engine.

4,509,497

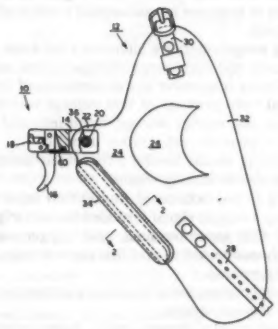
BOWSTRING RELEASE MECHANISM

Geary L. Garvison, 410 N. Shore Dr., South Haven, Mich. 49090

Filed Nov. 24, 1980, Ser. No. 209,757

Int. Cl.³ F41C *19/00*

U.S. Cl. 124—35 A **10 Claims**



1. A bowstring release mechanism which comprises:

a sheet of resilient, non-stretchable material shaped to overlie the palm of an archer's hand and having a thumbhole therein in combination with a triggered-latch mechanism affixed thereto;

said triggered-latch mechanism comprising an elongate rigid body in which the maximum dimension of any transverse

cross section is substantially smaller than the length of said body;

latch means in one end of said elongate body adapted releasably to engage a bow-string;

trigger means operatively associated with said latch means and adapted releasably to hold said latch means in latch position, whereby a bowstring is released when said trigger means is actuated;

first fastening means for fastening said sheet of material to the wrist of the archer with the thumb projecting through said thumbhole; and,

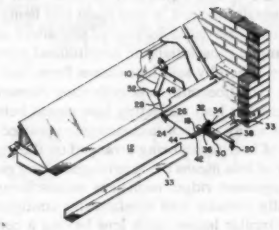
second fastening means for fastening said elongate body to said sheet at the end thereof opposite said latch means and in a position such that, when said latch means is latched onto a bowstring and drawn to the desired release position, the end of said elongate body which is fastened to said sheet is disposed in the crotch of the thumb and trigger finger; said elongate body being of such a length that when the end thereof which is attached to said sheet is so disposed in said crotch, it extends out to a position beyond and along side of the folded-back middle finger of the archer and along said trigger finger to a position where said trigger means can be actuated by said trigger finger to effect release of a bowstring and, when not latched, dangles down from said second fastening means in a position to be easily engaged by the thumb and forefinger for the purpose of latching it onto a bowstring.

4,509,498

DAMPER CONTROL

W. Dean England, 2615 - 109th Pl. NE., Belleuve, Wash. 98004, and Gerald J. Enneking, 4243 SW. 328th, Federal Way, Wash. 98003

Filed Feb. 18, 1982, Ser. No. 349,855
Int. Cl.³ F23L *13/02*
U.S. Cl. 126—288 **5 Claims**



1. A front operated damper control for a fireplace having a damper with a downward projecting operating arm and a lintel extending across the top of its frontal opening, comprising:

(a) an adjustable height support bracket securable to the lintel;

(b) a control lever including, at least, a right angle bell crank lever pivotally secured near the intersection of its two arms to the support bracket for rotation in a horizontal plane with the body of one arm defining a plurality of holes extending inwardly in sequence from its outer end;

(c) a horizontal connecting rod having a hook in its end which engages the rod by extending through one of the holes in the control lever arm from below;

(d) an upright connecting rod having an offset loop in its end for engaging the damper operating lever; and

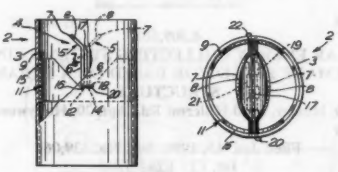
(e) means for adjustably connecting the horizontal connecting rod to the upright connecting rod.

4,509,499

ENERGY EFFICIENT DAMPER FOR A FURNACE

Alfred M. Hebert, Skidmore Rd., Pleasant Valley, N.Y. 12569

Continuation-in-part of Ser. No. 342,817, Jan. 26, 1982, Pat. No. 4,449,512. This application Apr. 16, 1984, Ser. No. 600,909
Int. Cl.³ F23L *3/00*
U.S. Cl. 126—292 **3 Claims**



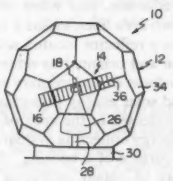
1. A damper for sealing and unsealing a vertical furnace exhaust flue pipe to minimize the escape of heat when the furnace is not operating, said damper comprising a cylindrical body adapted to form a section of vertical flue pipe having inner and outer walls, said cylindrical body having a top opening and a bottom opening, at least one transverse hinge rod horizontally transversing said body carried by opposed apertures in opposing wall portions of the body, an annular rim mounted on the inner wall of the body, a pair of oppositely extending gull-wing shaped damper shutters pivotably mounted on said hinge rod, each of said pair of gull-wing shaped damper shutters having upper and lower surfaces, each of said gull-wing shaped shutters having a lower section and an outer upper section, and in the closed condition the lower sections of the shutters extending upwardly and outwardly at approximately a 45° angle and the outer upper sections of the shutters extending horizontally and slightly spaced from the inner walls of the damper section, the upper surface of said annular rim being contoured to match the lower surface of said shutters along their edges in the closed condition so that the edges of the lower surface of said shutters rest on said rim to close said damper, and the lower edges of said shutters engaging said annular rim so as to prevent the lower edges from becoming wedged against the inner wall of the damper section, said gull-wing shaped damper shutters opening to a vertical position when said furnace is operating and closing when said furnace is not operating.

4,509,500

SOLAR ENERGY COLLECTION APPARATUS

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Jan. 19, 1983, Ser. No. 459,087
Claims priority, application Japan, Jan. 26, 1982, 57-10680
Int. Cl.³ F24J *3/02*
U.S. Cl. 126—425 **16 Claims**



1. A solar ray collection apparatus comprising:

solar ray collector means for collecting the solar rays, said means including a plurality of lenses which define a light receiving surface; and

a housing or capsule made up of a number of interconnected transparent members plates which are interconnected to enclose the solar ray collector means thereinside, said transparent plates being inclined at a plurality of different

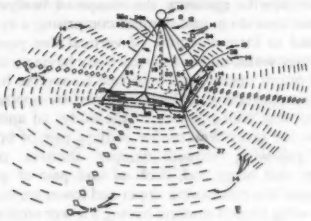
angles and being configured such that, when intersected by imaginary lines which extend from the peripheral edge of the light receiving surface, perpendicularly to the light receiving surface, the transparent plates are inclined relative to said imaginary lines by the maximum value within the angular range which allows the sun rays to penetrate the capsule.

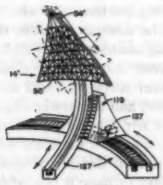
4,509,501

SOLAR ENERGY COLLECTING SYSTEM USING A PRIMARY REFLECTOR BASED ON A PYRAMID STRUCTURE

Larry D. Hunter, 1920 Hillcrest Rd., Apt. 20, Hollywood, Calif. 90068

Filed Jan. 13, 1982, Ser. No. 339,069
Int. Cl.³ F24J 3/02
U.S. Cl. 126—439 **30 Claims**





1. A solar energy collecting system comprising a primary reflector located in open exposure to the sun and formed of a plurality of intersecting reflecting surfaces, at least some of which are bounded by at least two adjacent arris lines of a pyramid having a polygonal base, and at least a pair of said reflecting surfaces bounded by said adjacent arris lines intersect at an obtuse angle in a line which lies in a plane perpendicular to said base, whereby said pair of reflecting surfaces defines a dihedral, and the reflecting surfaces bounded by said two arris lines reflect light impingent thereon into a concentrated field of reflection, and when projected onto a plane defined by said two arris lines, define a face of said pyramid, at least one secondary reflector located within said concentrated field of reflection and oriented to return light reflected from said reflecting surfaces of said primary reflector to the apex of said pyramid, and solar energy collection means located so as to receive light reflected to the apex of said pyramid.

15. In a solar energy collecting system comprising a reflector disposed on the surface of a backing, the improvement comprising a plurality of planar reflecting surfaces arranged in fixed disposition relative to each other, pairs of said planar surfaces intersecting each other along a line, said line oriented at a non-perpendicular angle to the surface of the backing, said surfaces forming at least one fixed obtuse angle said surfaces reflecting light impingent thereon into a concentrated field of reflection including a region of double reflection, a solar energy collection means, and means for moving said reflector to track the sun while maintaining said reflecting surfaces in the aforesaid fixed disposition relative to each other so that said collection means is continuously located within said region of double reflection.

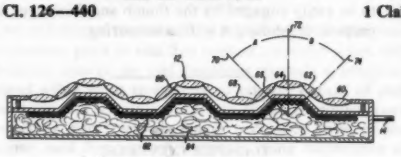
16. In a solar energy collecting system employing a solar energy collector and at least one reflector for focusing light into said solar energy collector, comprising a backing at least two planar reflecting surfaces which are arranged in fixed disposition relative to each other and which intersect along a line to form at least one obtuse angle and which reflect light impingent thereon into a region of overlapping reflections said line oriented at a non-perpendicular angle to the surface of the backing, and means for mounting said reflector in mobile fashion to track the azimuth and zenith of the sun according to inputs determined by latitude and longitude, time of solar day, and the date of the solar year to maintain said reflector in focus on said solar energy collector with said solar energy collector remaining in said region of overlapping reflections while said reflecting surfaces remain in said fixed disposition relative to each other.

4,509,502

MULTIPLE LENS COVER FOR SOLAR HEATING PANEL

Jack Youchu, 100 Elm Dr., Levittown, N.Y. 11756

Filed Nov. 15, 1982, Ser. No. 441,453
Int. Cl.³ F24J 3/02
U.S. Cl. 126—440 **1 Claim**



1. A cover for use with a solar panel, comprising a sheet of transparent material having periodic undulations forming parallel elongate upraised ridges, each said ridge having a top and sides and a valley extending between adjacent ridges in the surface thereof, and a plurality of solar heat collecting lens means integrally formed in said sheet and being arranged substantially over the entire surface of said sheet, said lens means being arranged substantially in longitudinal rows aligned with said ridges, whereby said lens means focus and intensify incident solar radiation onto heat collecting elements of the solar panel, said solar heat collecting lens means being arranged in three rows along each of said elongate upraised ridges, one of said rows of lens means being arranged on the top of said ridge, and a row of lens means being arranged along each side of said elongate upraised ridge, each lens means being formed as a substantially circular lens substantially contiguous to its next adjacent circular lenses, each lens having a central axes, and wherein said lenses arranged along the sides of said upraised ridges are arranged at angles such that the angle subtended by the central axes of said two side rows is 90°.

4,509,503

SOLAR HEATING SYSTEM

James E. Young, Box 1052, Alamosa, Colo. 81101

Filed Apr. 11, 1983, Ser. No. 483,638
Int. Cl.³ F24J 3/02
U.S. Cl. 126—452 **23 Claims**

1. A combination solar energy system for preheating a supply of hot water and supplementing heat in a building comprising:

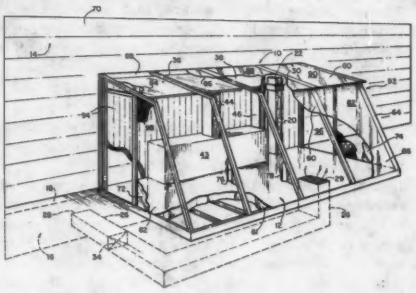
solar enclosure means for collecting large quantities of low temperature heated air;

an air space within said building having a structure capable of storing heat provided by said low temperature heated air;

duct means for delivering said low temperature heated air to

said airspace and for returning air from said airspace to said solar enclosure means;

solar concentration collector means disposed within said solar enclosure to collect high temperature heated air within said solar enclosure;



phase change heat storage means for storing high temperature heat provided by said high temperature heated air; and

heat transfer means connected to said supply of hot water for transferring said high temperature heat from said phase change heat storage means to said supply of hot water to preheat said hot water.

4,509,504

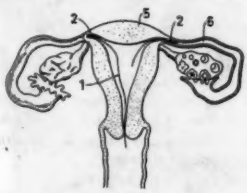
OCCLUSION OF BODY CHANNELS

Jan-Olof Brundin, Lidingö, Sweden, assignor to Medline AB, Stockholm, Sweden

Continuation-in-part of Ser. No. 870,595, Jan. 18, 1978, abandoned. This application Sep. 28, 1979, Ser. No. 79,951

Int. Cl.³ A61B *17/00*

U.S. Cl. 128—1 R **12 Claims**



1. A method of occluding a body reproduction duct of an animal comprising the steps of

(1) inserting a water-swellable contraceptive hydrogel article into said body reproduction duct;

(2) bringing said hydrogel into contact with animal tissue fluid;

(3) allowing said hydrogel to swell to an extent of at least 40% up to 300% of its original size and thereby

(4) contacting and impinging upon the body duct in which said device is inserted,

said device being substantially completely inert to said body fluid and the body tissue with which it is in contact, having a cross-sectional configuration corresponding to that of said reproduction duct and an indicator removal thread secured thereto.

4,509,505

ISOLATOR FOR CONFINING AND TRANSPORTING HUMAN BEINGS IN A STERILE ATMOSPHERE

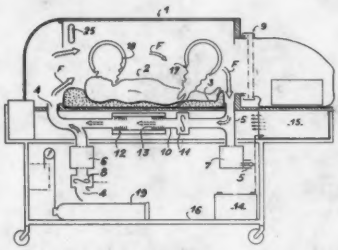
Gilles Mercey, Vendome; Claude Picard, Nanterre, and Bernard Saint-Martin, Paris, all of France, assignors to La Calhene Societe Anonyme, France

Filed Mar. 10, 1983, Ser. No. 474,717

Claims priority, application France, Mar. 12, 1982, 82 04199

Int. Cl.³ A61G *11/00*

U.S. Cl. 128—1 B **8 Claims**



1. An isolator for confining and transporting human beings in a sterile atmosphere comprising a tight enclosure; a first fan for providing a forced fresh air circulation through an absolute inlet filter and an absolute outlet filter for ventilating the enclosure, the first fan having a first preselected constant rotational speed; means for placing the first fan in an operative state or in an inoperative state; means adapted for rapid transfer of objects from the exterior to the interior of said enclosure; intervention means enabling functions to be performed within said enclosure while maintaining said sterile atmosphere, a portion of said intervention means forming an integral part of a wall of said enclosure; air recycling branch means interposed between said inlet filter and said outlet filter, said branch means containing a second fan having a second preselected constant rotational speed and variable temperature heating means automatically limited to a predetermined maximum temperature, said second fan and said heating means being operable to controllably reheat and recycle a portion of said fresh air circulation at a predetermined reference temperature; battery means capable of supplying all of the energy required by the isolator; and control means for regulating the temperature of the heating means to obtain an internal temperature within the enclosure equal to the reference temperature, the control means comprising a basic control portion responsive to the variation between an external temperature and the reference temperature and to the operative or inoperative state of the first fan for providing a first signal for controlling the heating means, and a complementary fine control portion responsive to the variation between the internal temperature and the reference temperature for providing a second signal for controlling the heating means.

4,509,506

SHIELDING DEVICE FOR RADIOACTIVE SEED

David C. Windorski, Cottage Grove, and David O. Kubiatowicz, White Bear Lake, both of Minn., assignors to Minnesota Mining & Manufacturing Co., St. Paul, Minn.

Filed May 11, 1981, Ser. No. 262,760

Int. Cl.³ A61J *1/00*

U.S. Cl. 128;1.2 **6 Claims**

1. A device for handling radioactive seeds comprising:

a. a curved tube of dense material open at both ends, said tube having an interior diameter larger than said seeds to allow said seeds to be moved freely therein and side walls of sufficient thickness to prevent radiation from penetrating therethrough;

b. a length of suture material located within said tube and not protruding through at least one of said open ends;

c. removable stop means attached to at least end of said suture material for preventing said end of said suture material from entering said tube; and

d. a plurality of surgically-implantable radioactive seeds within said tube arranged consecutively and spaced apart in said suture material, said seeds being spaced from said open ends so as to prevent radiation from escaping from said open ends.

4,509,507

ENDOSCOPE APPARATUS

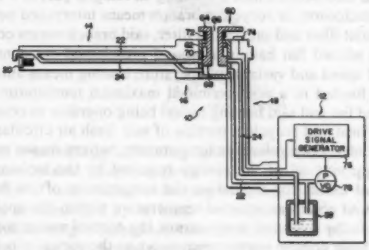
Hisao Yabe, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 318,265, Nov. 4, 1981,. This application Jan. 4, 1984, Ser. No. 568,278

Claims priority, application Japan, Nov. 12, 1980, 55-159245

Int. Cl.³ A61B *1/00*

U.S. Cl. 128—4 **1 Claim**



1. An endoscope apparatus comprising:

an endoscope body including an endoscope insertion section having a foremost end and a viewing window arranged at said foremost end;

an air supply pipe and a water supply pipe disposed within said endoscope body and integrally connected with each other at one end to form a discharge conduit through which a source of air and water is alternately directed in front of said viewing window, said air and water supply pipes being respectively divided into two sections;

a water supply source connected to said water supply pipe and an air supply source connected to said air supply pipe;

a variable output pump means connected to the upstream sides of said air supply source and to said water supply source and having first and second modes of output, the second output being higher than the first output;

a change-over valve arranged alternately to connect said sections of air and water supply pipes to said foremost end and formed by a cylinder having an inner circumferential face connected with said sources of air and water supply, and a piston within said cylinder for selectively and alternatively supplying air to said air supply pipe and water to said water supply pipe, the piston having a first diameter portion and second diameter portion which is larger than the first diameter portion and a leak hole connecting the inside of the cylinder with the outside of the cylinder, the piston being normally urged outwardly by a spring to shut off said water supply source by means of said second diameter portion and to connect said air supply source through said first diameter portion, and when pushed down into said cylinder against said spring, to shut off the air supply by means of said second diameter portion and thereby connect said water supply through said first diameter portion;

a detector switch arranged adjacent to said changeover valve and generating a detection signal when said piston is pushed down into said cylinder; and

a drive signal generator for supplying a first signal to said variable output pump means causing said pump means to be operated in the second mode, and after a predetermined period of time after the detection signal is generated, for supplying a second signal to said pump means thereby causing said pump means to be operated in the first mode.

4,509,508

ENDOSCOPE SYSTEM

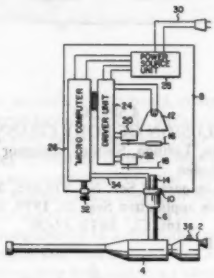
Takashi Tsukaya, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Oct. 28, 1982, Ser. No. 437,461

Claims priority, application Japan, Nov. 5, 1981, 56-177751

Int. Cl.³ A61B *1/06*

U.S. Cl. 128—6 **7 Claims**



1. An endoscope system comprising:

a memory for storing control data;

a chip selector operatively connected to said memory for applying a chip enabling signal to the memory to hold the memory in an enabling state in which the control data can be read out from the memory;

means for producing setting signals;

a processor operatively connected to said means, for fetching the setting signals as instruction commands, operating the chip selector and reading out the control data from the memory in response to the setting signals when the memory is maintained in the enabling state by the chip selector;

a light source in said endoscope system;

means operatively connected to the light source for adjusting power supplied to the light source in response to the receipt of the control data;

means for producing an alarm signal while the memory is not maintained in the enabling state by the chip selector which is operated under the control of the processor although the setting signals are being produced; and

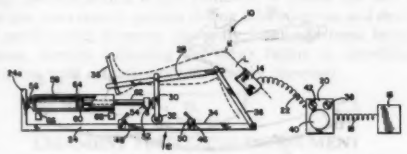
means operatively connected to said alarm signal producing means for causing the adjusting means to operate the light source at a fixed brightness in response to the alarm system.

4,509,509

APPARATUS FOR TREATING THE JOINTS OF THE HUMAN BODY

Jean Bouvet, 1319 Butterfield Rd., San Anselmo, Calif. 94960, and Robert D. Tensdale, 307A Third St., Sausalito, Calif. 94965

Filed Jul. 11, 1983, Ser. No. 512,669
Int. Cl.³ A61H 29/00
U.S. Cl. 128—24.1 6 Claims



1. Apparatus for treating the joints of the human body comprising:

a machine operative to support a human limb and, without physical participation of the patient, to flex a joint including same, while a portion on said machine moves back and forth along a given path; and

an electrical stimulator including an electrode to be attached to the skin of the human body in areas over muscles affected by the flexing of a joint and a stimulator electric circuit with a signal source including said electrode;

the improvement comprising:

an electrically actuated switch device in said stimulator electric circuit;

a control circuit with a source of control current;

said electrically actuated switch device being in said control circuit to be energized thereby; and

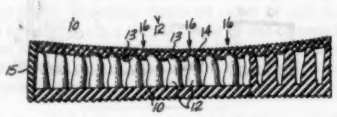
a pair of limit switches in said control circuit, each selectively positioned along said given path and engageable by said machine portion to energize said switch device during a predetermined stage of the back and forth movement thereof.

4,509,510

MASSAGE TREAD FOR HUMAN SKIN

Clarence L. Hook, P.O. Box 4109, Bellevue, Wash. 98009

Continuation-in-part of Ser. No. 334,741, Dec. 28, 1981, abandoned. This application Nov. 5, 1982, Ser. No. 439,649
Int. Cl.³ A61H 7/00; A43B 13/38; A47C 23/00
U.S. Cl. 128—25 R 12 Claims



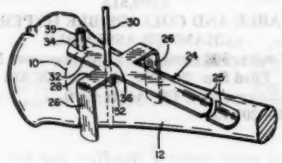
1. A surface for contact by human skin intermittently urged thereagainst, comprising a base member having spaced apart, upwardly projecting, flexible tines, each of said tines having a height a plurality of times greater than its diameter; and an upper surface member having a lesser hardness than said tines, disposed above and being provided with depressions therein when the upper surface of said tines are relatively urged thereagainst, and being mechanically engaged with the said tines through said depressions and the upper portions of said tines urged into said depressions, said tread surfaces reacting to massage human skin portions urged toward such upper surface.

4,509,511

METHOD AND APPARATUS FOR CORRECTIVE OSTEOTOMY

John A. Neufeld, 20840 Charriere Rd., Oregon City, Oreg. 97045

Filed Jun. 30, 1983, Ser. No. 509,339
Int. Cl.³ A61F 5/04
U.S. Cl. 128—92 H 17 Claims



1. Apparatus employed in an arcuate osteotomy procedure comprising:

a gauge having a central member provided with a pair of spaced, depending arms adapted to fit on either side of the bone on which the osteotomy is to be performed for the purpose of determining the center axis, radius, and position of an arcuate cut through the bone, said central member being provided with a central alignment index point for locating the center axis of said arcuate cut through said bone, while the spacing of said arms gauges the length of the chord demarcating said arcuate cut,

a guide rod for reception in a drilled hole in said bone in substantial registry with said alignment index point,

and a saw comprising a semi-circular blade, said blade having teeth at a forward end thereof for making an arcuate cut through said bone,

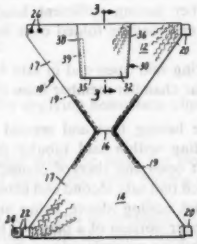
said saw having bearing means for slidably receiving said rod to guide said saw in making said arcuate cut.

4,509,512

SUPPORT UNDERGARMENT FOR PENILE PROTHESIS IMPLANT PATIENT

Marion J. LeClercq, 2893 Knox Ave. S., Apt. 216, Minneapolis, Minn. 55408

Filed Apr. 6, 1983, Ser. No. 482,422
Int. Cl.³ A61F 5/40
U.S. Cl. 128—160 11 Claims



1. An undergarment for protecting and supporting a continually erected penis of a prothesis implant patient, which undergarment comprises

triangular front and rear cloth panels connected together at apices to form a crotch,

elastic bands puckering the edges of the panels in the vicinity of the crotch,

a trapezoidal cloth flap with its first parallel side permanently attached to the front panel along the top of the

panel, one of its sides which are adjacent to said first side being permanently and the other being releasably attached to the front panel, and its second parallel side being open at the bottom to provide a pocket for the erected penis, means for fastening the free corners of said panels together around the wearer's waist with said flap between the abdomen of the wearer and his penis.

4,509,513

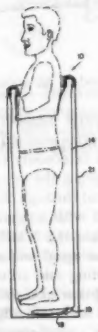
PORTABLE AND COLLAPSIBLE HYPERBARIC CHAMBER ASSEMBLY

Robert A. Lasley, 508 Sentinel Rd., Moorestown, N.J. 08057

Filed Sep. 29, 1982, Ser. No. 426,634

Int. Cl.³ A61H *9/00*

U.S. Cl. 128—202.12 **6 Claims**



1. A portable and collapsible hyperbaric chamber assembly adapted to accommodate a major portion of a patient's body and adapted for connection to means for supplying pressurized oxygen or other suitable gas to and exhausting from said chamber, said chamber comprising

a circular frame having a U-shaped cross section wherein the closed portion of the U constitutes the frame base and the depending portions form the inner and outer frame walls, said circular frame being sized to fit around the patient's torso,

a flexible tubular chamber member having first and second open ends, said first open end being secured to the outer frame wall and extending downwardly therefrom, said tubular member having sufficient length whereby the second open end may be folded over and under the patient's feet,

means for securing said open end in said folded position to seal the tubular chamber member from the ambient atmosphere,

a sealing sleeve having first and second open ends, said sleeve extending within said tubular chamber member with said first open end thereof connected to the inner frame wall such that said second end extends downwardly therefrom, said sealing sleeve being sized to sealingly engage the upper portion of a patient's body,

the frame base having mounting connection means adapted to receive pressurized oyygen or some other suitable gas,

whereby a patient is positioned within the tubular chamber member and sealing sleeve with the sealing sleeve sealingly contacting the upper portion of the patient's body, then the tubular chamber member is folded below the patient's feet and secured by said securing means to form an airtight seal therein so that an airtight chamber is provided between the tubular chamber the patient's body and the sealing sleeve to receive the pressurized oxygen as required for treatment.

4,509,514

ARTIFICIAL AIRWAY DEVICE

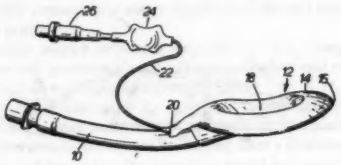
Archibald I. J. Brain, Flat 1, 6 Claremont Rd., Folkestone, Kent, England

Filed Dec. 14, 1982, Ser. No. 449,728

Claims priority, application United Kingdom, Dec. 16, 1981, 8137899

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—207.15 **5 Claims**



1. An artificial airway device to facilitate lung ventilation in an unconscious patient, comprising a curved or flexible tube and a mask portion carried at one end of the tube, the mask portion having a soft flexible annular peripheral formation which surrounds a hollow interior space or lumen of the mask, said annular peripheral formation of the mask being preformed with a roughly elliptical shape capable of conforming to, and fitting readily within the actual and potential space behind the larynx and to form a seal around the circumference of the laryngeal inlet without the device penetrating into the interior of the larynx, the tube opening into the lumen of the mask to provide the airway with the axis of the tube substantially aligned with the length of the roughly elliptical annular periphery of the mask.

4,509,515

INHALATION DEVICE

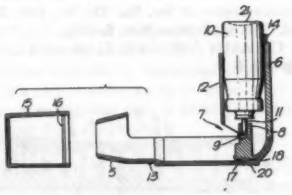
Roger E. C. Altounyan, Wilmslow, and Richard M. Auty, Rempstone, both of England, assignors to Fisons plc, Ipswich, England

Filed Feb. 7, 1983, Ser. No. 464,421

Claims priority, application United Kingdom, Feb. 23, 1982, 8205240

Int. Cl.³ A61M *15/00*

U.S. Cl. 128—200.23 **11 Claims**



1. An aerosol inhalation device, suitable for use in association with a pressurized medicament composition aerosol container, comprising in combination an elongate open trough member, a mouthpiece having a continuous tubular wall member and an aerosol dispenser having a body and a spray orifice at the dispenser discharge end, said tubular mouthpiece extending from one end of the elongate open trough member and in axial alignment therewith, and pivot means adjacent the other end of said open trough member for pivotally connecting said other end to the aerosol dispenser body at said discharge end adjacent said spray orifice, the elongate open trough member being pivotally movable between an open inhalation position and a closed position, the spray orifice being directed towards the mouthpiece in the open inhalation position with the open trough member open vertically upward during inhalation use,

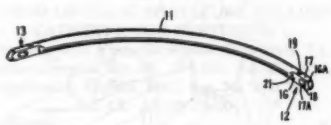
and in the closed position the elongate open trough member fitting around the body of the aerosol dispenser, and the elongate open trough member being of such a length that the mouthpiece is able to fit over the non-discharge end of the aerosol dispenser said device being suitable for use in association with a cylindrical pressurized medicament composition aerosol container of about 2.4 cm diameter and about 5 cm length, and wherein the length of the elongate open trough member is from 5 to 10 cm, measured from the pivot to the point of attachment of the mouthpiece whereby said open trough portion is of a length sufficient to enable the user to view the open trough portion during inhalation use and detect any medicament escaping upwardly from said open trough portion, thereby indicating the user's failure to coordinate inhalation with actuation of said aerosol dispenser.

4,509,516

LIGAMENT TUNNELING INSTRUMENT

James W. Richmond, Comstock Township, Kalamazoo County, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.

Filed Feb. 24, 1983, Ser. No. 469,366
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—303 R **4 Claims**



2. A surgical instrument, comprising: an elongated, substantially rigid rod which is of arcuate shape in plane view, said rod having end portions at opposite ends thereof and a central portion extending between said end portions, said central portion having the cross-sectional shape of a closed smooth curve, said end portions being of reduced thickness relative to the thickness of said central portion and having an out-of-round cross section, each of said end portions having an eyelet therein extending transversely therethrough, the tips of each of said end portions being smoothly rounded so that said rod can be pushed through a joint in the human body, either end first, whereby to form a tunnel between the body tissue in and around that joint, each of said end portions having handle-attaching means thereon, and a handle releasably fixedly securable to said handle-attaching means on either of said end portions, said handle having a through-hole of out-of-round cross section and sized to slidably receive said end portions so that said handle cannot rotate with respect to said rod when said handle is mounted on one of said end portions.

4,509,517

KIDNEY STONE INSTRUMENT

Henry S. Zibelin, 1423 26th St. NW., Winter Haven, Fla. 33880

Filed Sep. 30, 1982, Ser. No. 430,353
Int. Cl.³ A61B *17/00*
U.S. Cl. 128—319 **4 Claims**

1. An instrument for the removal of kidney stones that includes the combination of

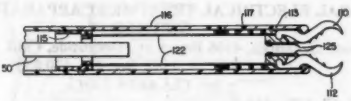
(a) a kidney stone grasping means comprising at least one pair of opposed jaw members that are mounted in a support which is mounted for axial movement in a tube,

(b) means for alternately moving said jaw members toward each other and away from each other, said means including

(1) a first resilient means for urging the toothed sections of said jaw members apart in an "open" position,

(2) at least one length of Nitinol having one end attached to said axially movable jaw member support and the other end attached to a spaced apart fixed point on the tube in which said jaw members are mounted,

(3) mechanical pressure means for maintaining sufficient pressure on said length of Nitinol when said length is below its critical temperature condition so that said length of Nitinol will be stretched in a lengthwise direc-



tion, but said sufficient pressure being inadequate to maintain said length of Nitinol in a stretched position when the Nitinol is heated above its critical temperature, and

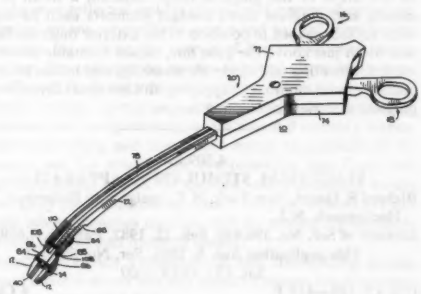
(4) means to control the temperature of said Nitinol, whereby said jaws will be maintained in an open position to receive kidney stones when said length of Nitinol is below said critical temperature and said jaws will move from an open to a closed position to grasp and/or crush kidney stones when said length of Nitinol is above said critical temperature.

4,509,518

APPARATUS FOR APPLYING SURGICAL CLIPS

Richard A. McGarry, Norwalk, and Douglas G. Noiles, New Canaan, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Feb. 17, 1982, Ser. No. 349,584
Int. Cl.³ A61B *17/04*
U.S. Cl. 128—325 **35 Claims**



1. Apparatus for applying hemostatic clips to tissue comprising:

a body;

means associated with the body for storing a plurality of undeformed hemostatic clips having elongated, spaced-apart arms;

a pair of jaws at one end of the body for receiving, holding and deforming a clip, the jaws being movable relative to each other in their common plane to deform the clip by bringing the spaced-apart arms of the clip towards one another;

means for camming the jaws closed including first cam surface means associated with the body, second cam surface means associated with the jaws, and means for moving the first and second cam surface means relative to each other to cause the jaws to move towards one another in their common plane to deform a clip;

means for feeding one clip at a time from the means for storing to the jaws; and

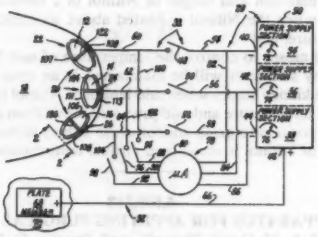
actuating and sequencing means for sequentially actuating the means for feeding and the means for camming the jaws closed including a pair of handles movable between a first open position and a second closed position, movement of said handles from said first open position to said second closed position first causing the means for feeding to move a clip from the means for storing to the jaws and then causing the means for camming the jaws closed to move the jaws towards each other to close the clip.

4,509,519

ORAL ELECTRICAL TREATMENT APPARATUS AND METHOD

Steven G. Detsch, 4146 Bryan St., Oceanside, Calif. 92054

Filed Sep. 21, 1982, Ser. No. 420,853
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—419 F **17 Claims**



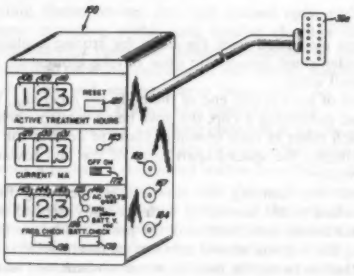
1. Oral electrical treatment apparatus comprising means for electrically contacting gingival tissue in a mouth, said gingival electrical contacting means comprising at least one electrode assembly including at least two elongated gingival tissue contact members each having an underside shaped to conform to the shape of the gingival tissue adjacent a tooth in said mouth, said gingival tissue contact members each having an inner surface shaped to conform to the exterior outer surface of said tooth just above the gum line, means locatable about said tooth for locating said electrode assembly, and means locatable outside of said mouth for supplying an electrical current to said gingival electrical contacting means.

4,509,520

ELECTRICAL STIMULATING APPARATUS

Richard S. Dugot, New York, N.Y., assignor to Biolectron, Inc., Hackensack, N.J.

Division of Ser. No. 350,440, Feb. 22, 1982, Pat. No. 4,459,988. This application Apr. 5, 1984, Ser. No. 597,171
Int. Cl.³ A61B *5/00*
U.S. Cl. 128—419 F **4 Claims**



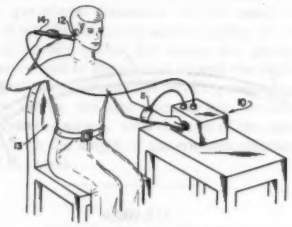
1. Apparatus for intermittently monitoring the operation of treatment apparatus having a multiple contact connector with terminals for first signals representative of stored treatment information in coded form and second signals representative of at least one property of a treatment signal in analog form, comprising a multiple contact connector having a plurality of contacts engageable with the contacts of said treatment apparatus connector, decoder means responsive to connector contacts carrying signals representative of said stored information for decoding the same, means responsive to said decoded stored information for exhibiting the latter visually, means connectable to connector contacts carrying signals representative of said at least one property of said treatment signal in analog form, peak detector means connected to produce a signal representative of said treatment signal property, analog-to-digital converter means for converting said last named signal to digital form, and means for exhibiting visually the output of said analog-to-digital converter means.

4,509,521

HEADACHE RELIEF METHOD

Terrence J. Barry, 6820 N. Augusta Dr., Hialeah, Fla. 33015

Filed Jan. 31, 1983, Ser. No. 462,350
Int. Cl.³ A61N *1/32*
U.S. Cl. 128—421 **7 Claims**



1. A method of relief for a headache sufferer comprising the step of applying electrical pulses from a ground electrode and a live electrode to said sufferer, said pulses characterized by:

(a) a frequency in the range of from 10 to 12 pulses per second,

(b) a pulse shape approximately square,

(c) a pulse width between 35 and 45 microseconds,

(d) an amplitude in the range of from somewhat below said sufferer's pain threshold to said pin threshold, and

(e) said pulses being applied to the sufferer by placing the ground electrode on a body portion other than the neck or head and applying the live electrode to the sufferer's neck or head.

4,509,522

INFRARED OPTICAL MEASUREMENT OF BLOOD GAS CONCENTRATIONS AND FIBER OPTIC CATHETER

Thomas J. Manuccia, Silver Spring, Md., and J. Gary Eden, Urbana, Ill., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

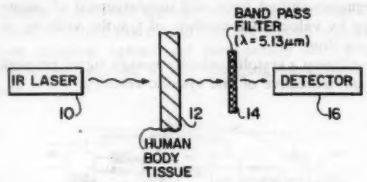
Filed Dec. 15, 1981, Ser. No. 331,091
Int. Cl.³ G01N *33/16*
U.S. Cl. 128—634 **6 Claims**

1. A method of determining the absolute concentrations of CO, CO_2 and O_2 in blood comprising the steps of:

selectively passing infrared light of near 5.13 μm, 4.3 μm and 9.0 μm through a dimension of blood and measuring magnitudes of transmission at absorption peak wavelengths near 5.13 μm, 4.3 μm and 9.0 μm, corresponding to CO, CO_2, and O_2, respectively;

comparing said respective transmissions to transmissions through like dimension reference samples of blood whose blood gas concentrations are known;

determining the absolute concentrations of CO, CO_2, and O_2, biased on the comparison of transmission through the



blood dimension at these wavelengths to transmission through the reference blood samples having known concentrations of CO, CO_2, and O_2.

4,509,523

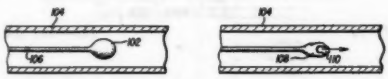
METHOD OF USING MINIATURE BALLOON CATHETER FOR PERFUSING

Paul H. Pevsner, 4121 Kingcrest Pkwy., Richmond, Va. 23221

Continuation-in-part of Ser. No. 286,100, Jul. 22, 1981,. This application Sep. 30, 1982, Ser. No. 430,217

Int. Cl.³ A61M *25/00*

U.S. Cl. 128—658 **6 Claims**



1. A diagnostic and therapeutic method for carrying out perfusion procedures in small vessels comprising the steps of:

preparing a miniature balloon catheter assembly including an inflatable balloon formed to be extremely thin by aerosolizing balloon-catheter-material solution onto a mandril and allowing it to cure, said balloon having no perfusion hole therein and being connected to a distal end of a resilient cannula, said balloon and said cannula having a size for insertion into blood vessels and said inflatable balloon being constructed to be inflated and deflated in said blood vessels for being transported and directed therein by the flow of blood, said balloon being further constructed to be inflated until bursting in a particular blood vessel without damaging said particular blood vessel;

inserting the distal end of said cannula including said inflatable balloon, into a blood vessel;

attaching the proximal end of said cannula to a source of pressurized fluid and pressurizing the balloon to partially inflate the balloon to permit the balloon and the attached cannula to be transported by blood flow within the vessel to said particular blood vessel;

increasing the fluid pressure inside the balloon portion to expand the thin balloon portion until said balloon portion bursts, thereby causing a rupture hole in the thin balloon; and

inserting a therapeutic perfusate into the proximal end of said cannula and perfusing said perfusate into said blood vessel via said ruptured hole in said burst balloon.

4,509,524

ULTRASONIC MEDIUM CHARACTERIZATION SYSTEM

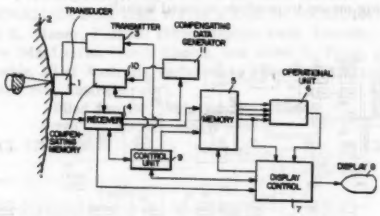
Hirohide Miwa, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Sep. 29, 1982, Ser. No. 426,700

Claims priority, application Japan, Sep. 30, 1981, 56-155271

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—660 **10 Claims**



1. An apparatus for characterizing an inhomogeneous medium using ultrasonic waves, comprising:

transducing means for transmitting ultrasonic waves having a plurality of frequency components to a reference medium having at least one reference reflector provided therein, receiving ultrasonic waves reflected by the reference reflector, transmitting ultrasonic waves having a plurality of frequency components to an inhomogeneous medium, and receiving ultrasonic waves reflected by the inhomogenous medium;

compensating means, operatively connected to said transducing means, for analyzing the frequency components of the ultrasonic waves reflected by each reference reflector, for generating compensating data based on the analysis of the frequency components of the waves reflected by each reference reflector and for storing said compensating data;

memory means, operatively connected to said transducing means, for storing the output of the transducing means when the transducing means receives ultrasonic waves reflected from the inhomogeneous medium;

control means, operatively connected to said transducing means, said compensating means and said memory means, for controlling said transducer means to transmit or receive and for reading the compensating data from said compensating means, for causing said transducing means to apply the compensating data to the signal received from the inhomogeneous medium, and for storing the compensated data in said memory means;

means, operatively connected to said transducing means, said control means and said memory means, for displaying said compensated data.

4,509,525

ULTRASONIC DIAGNOSTIC EQUIPMENT

Yasutsugu Seo, Ootawara, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 23, 1982, Ser. No. 422,174

Claims priority, application Japan, Dec. 3, 1981, 56-193642

Int. Cl.³ A61B *10/00*

U.S. Cl. 128—663 **7 Claims**

1. An ultrasonic Doppler system for displaying a pattern of a fluid moving within an object, comprising:

an ultrasonic transducer array having plural transducer elements for transmitting an ultrasonic beam and generating echo signals from the echos reflected from an object;

means for exciting said transducer elements to generate the ultrasonic beam that propagates along a predetermined scanning line on the object;

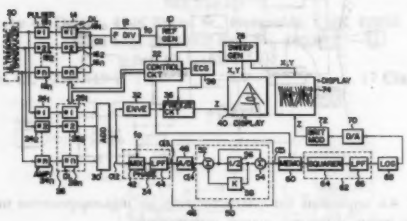
receiver means for time delaying and summing said echo

signals to produce summed output signals representative of echoes along a predetermined scanning line;

phase detecting means for selecting Doppler shift signals from said summed output signal to produce phase detected signals representative of Doppler shifts associated with points along a predetermined scanning line;

digital filtering means for removing the phase detected signal component of objects moving at lower speed than a predetermined speed from said Doppler shift signals and for producing digital signals;

means for squaring the digital signals from said digital filtering means to produce squared signals;



means for brightness modulating responsive to the amplitude of the squared signals and outputting signal modulated by said amplitudes for representing said fluid pattern at successive depths along said predetermined scanning line to thereby produce an output pattern line; and

display means for displaying the output signal from said brightness modulating means, said display means comprising means for displaying successive pattern lines as a function of time in real time, whereby said display means displays said fluid pattern without determining the velocity of the fluid.

4,509,526

METHOD AND SYSTEM FOR NON-INVASIVE ULTRASOUND DOPPLER CARDIAC OUTPUT MEASUREMENT

Stephen R. Barnes; Gary L. Tarbox, both of Seattle; Lee L. Huntsman, Bainbridge Island, and Barry D. McLaren, Auburn, all of Wash., assignors to Lawrence Medical Systems, Inc., Redmond, Wash.

Filed Feb. 8, 1983, Ser. No. 464,965
Int. Cl.[3] A61B *10/00*
U.S. Cl. 128—663 **23 Claims**

1. A method for the noninvasive measurement of cardiac output of a mammalian patient on a real time, beat-by-beat basis as a combined function of the cross-sectional area of the ascending aorta and the systolic velocity of blood flow therethrough, comprising the steps of:

a. pulsedly insonifying the ascending aorta of said patient with repetitive, intermittent ultrasonic energy propagating along a line generaliy transverse with respect to the axis of said ascending aorta to define a first insonification zone;

b. receiving pulses of ultrasonic energy reflected from anatomical structure within said first insonification zone, including energy reflected from the anterior and posterior walls of said ascending aorta characteristic of the separation thereof along the transverse line of propagation;

c. discriminating said pulses of received ultrasonic energy to detect the transverse dimension of said ascending aorta between said anterior and posterior walls thereof;

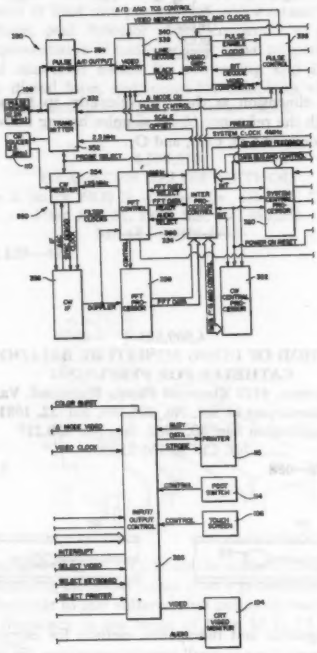
d. developing an aortic diameter signal proportional to and indicative of said transverse dimension;

e. computing the cross-sectional area of said ascending aorta in the plane of said transverse line of porpagation of pulsed energy;

f. continuously insonifying said ascending aorta with uninterrupted ultrasonic energy propagating along a line generally axial with respect to the axis of said ascending aorta to define a second insonification zone;

g. receiving Doppler-shifted ultrasonic energy reflected from pulsatile blood flow through said ascending aorta, frequency-shifted from said uninterrupted ultrasonic energy by values characteristic of systolic velocity of said blood flow;

h. developing a systolic velocity energy signal proportional to and indicative of said systolic velocity;



i. subjecting said systolic velocity energy signal to frequency spectrum analysis at a predetermined signal sampling rate to yield a velocity component profile signal;

j. integrating said velocity component profile signal over time for each period of said pulsatile flow to calculate a systolic velocity integral;

k. computing systolic volume as a combined function of said cross-sectional area and said systoiic velocity integral;

l. computing cardiac output as the sum of said systolic volumes for n periods and dividing the sum by the time duration thereof.

4,509,527

CARDIO-RESPIRATION TRANSDUCER

Jacob Fraden, Hamden, Conn., assignor to Timex Medical Products Corporation, Waterbury, Conn.

Filed Apr. 8, 1983, Ser. No. 483,358
Int. Cl.[3] A61B *5/10*
U.S. Cl. 128—671 **23 Claims**

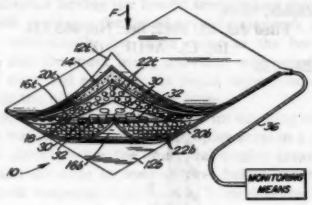
1. A laminated, sheet-like transducer for electrical connection connected to electronic circuit means responsive to changing mechanical forces applied to said transducer, comprising:

a top flexible plate including a first surface having a matrix of uniformly spaced-apart first convex members,

a bottom flexible plate including a second surface having a matrix of uniformly spaced-apart second convex members

aligned with the spaces between said first convex members,

an electret made of a synthetic resin polymer sandwiched between said first and second surfaces of said top and bottom plates, said electret producing electrical charges when deformed due to said first and second convex members pressing against and horizontally stretching said electret in response to said changing mechanical forces, and



electrodes attached to opposite surfaces of said electret, said electrodes forming a uniformly spaced-apart, electrically interconnected electrode configuration on at least one surface of said electret, said electrodes sensing said electrical charges producing a signal for transmission to said electronic circuit means which is proportional to the magnitude of said changing mechanical forces.

4,509,528

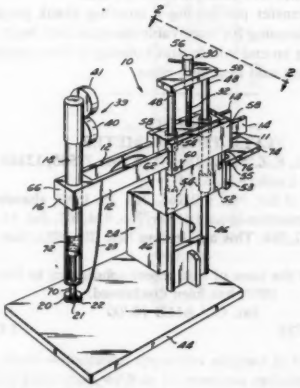
HEMOSTAT WITH BLOOD FLOW SENSOR

Harvinder Sahota, 3861 Wisteria, Seal Beach, Calif. 90740

Continuation-in-part of Ser. No. 331,236, Dec. 16, 1981,. This application Jul. 15, 1982, Ser. No. 398,621

Int. Cl.³ A61B *5/02, 17/12*

U.S. Cl. 128—691 **27 Claims**



1. A hemostat for controlling the flow of blood in a blood vessel to a puncture site in the body, comprising:

a mounting fixture;

an arm adjustably mounted to said mounting fixture;

a non-inflatable pressure pad mounted to said arm for applying pressure to said blood vessel at a location upstream from said puncture site;

an electronic sensor mounted with said pressure pad for sensing blood flow through said vessel past said pressure location, said sensor being responsive to the rate of blood flow through said vessel, and providing an output signal to indicate changes in blood flow through said vessel to attending personnel;

means for adjusting the force applied by said pressure pad to said blood vessel so that blood flow through said blood vessel may be accurately controlled; and

means for indicating the force applied by said pressure pad to said blood vessel.

4,509,529

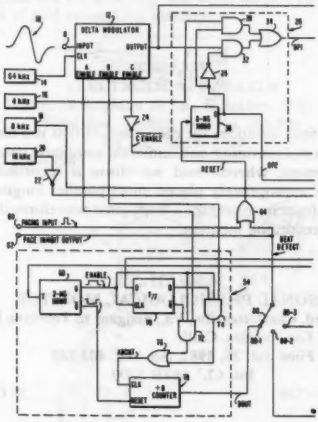
PHYSIOLOGICAL EVENT RECOGNITION TECHNIQUES FOR USE WITH A DELTA MODULATOR

David K. Money, Pennant Hills; Stephen Swift, Hornsby; Andrew MacLaurin, North Epping, and John G. Frost, West Pymble, all of Australia, assignors to Telectronics Pty. Ltd., Lane Cove, Australia

Filed Jun. 30, 1982, Ser. No. 393,6[illegible]

Int. Cl.³ A61B *5/04*

U.S. Cl. 128—708 **31 Claims**



1. A system for recognizing a cardiac event of interest by operating on a sensed cardiac signal comprising means for deriving from said sensed signal a first continuous sequence of bit samples, the two states of said bit samples representing changes in opposite directions in the sensed signal and bit samples of alternating opposite states representing a non-changing sensed signal, means for generating a second continuous sequence of bit samples which is the same as said first sequence but delayed in time, means for deriving a count which is indicative of on-going differences between said first and second bit sample sequences, and recognition logic means responsive to said count for indicating a cardiac event of interest.

4,509,530

SYSTEM FOR PLOTTING A MINIATURE ECG

Huntington W. Curtis, Chelsea; Frederick A. Dodge, Katonah; David B. Francis, Mt. Kisco, and John V. Mizzi, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 27, 1983, Ser. No. 565,499

Int. Cl.³ A61B *5/04*

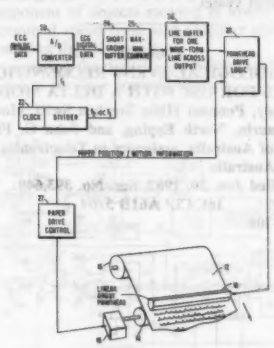
U.S. Cl. 128—710 **13 Claims**

1. A method of printing an analog waveform having a time variable comprising the steps of:

converting said analog waveform into a time sequence of digitally expressed values;

forming predetermined groups of said digital data and determining maximum and minimum amplitude values of said digital data within said groups;

serially storing said maximum and minimum values;
moving a recording medium past a transversely oriented linear array of discrete recording elements; and
reading out in parallel in accordance with said serial stored values to said recording elements and actuating respective elements in parallel by said stored values at initial times



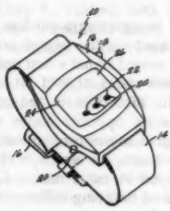
and for time durations for each element that is a function of the stored maximum and minimum amplitude values for that element, wherein said waveform is recorded as a series of appropriately placed short parallel longitudinal lines to form in aggregate a transverse waveform display on said recording medium.

4,509,531

PERSONAL PHYSIOLOGICAL MONITOR

John W. Ward, Charlottesville, Va., assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Jul. 28, 1982, Ser. No. 402,533
Int. Cl.³ A61B 5/00
U.S. Cl. 128—736 **26 Claims**



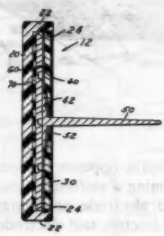
16. Apparatus for physiological monitoring of a subject comprising:
a case, including an electrically conductive underside adapted for electrical contact with said subject; said underside including an aperture therein;
temperature sensing means, including a temperature sensitive element and disposed within said case, for generating a temperature signal indicative of temperature;
an electrically and thermally conductive cap; adapted to receive said temperature sensitive element in electrical and thermal contact with the interior thereof;
retainer means for securing said cap in said underside aperture, to dispose said cap for electrical and thermal contact with said subject, electrically and thermally isolated from said underside;
means for providing electrical connections to said temperature sensitive element and said cap;
resistance sensing means, electrically connected to said underside and said cap, for generating a resistance signal indicative of the galvanic skin resistance of said subject; and
alarm means, responsive to said temperature signal and said resistance signal for generating alarm indicia in response to predetermined physiological conditions of said subject.

4,509,532

CARDIOPLEGIA TEMPERATURE INDICATOR

James H. DeVries, Grand Rapids, Mich., assignor to DLP, Inc., Grand Rapids, Mich.

Filed Jul. 29, 1982, Ser. No. 403,124
Int. Cl.³ A61B 5/00
U.S. Cl. 128—736 **11 Claims**



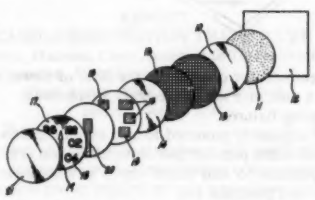
1. A visual temperature monitor for use in open heart surgery and adapted to be used in connection with cardioplegia systems for reducing the temperature of the heart which comprises:
(a) a double walled housing providing between the walls a relatively thin chamber, one of the walls of said housing being transparent,
(b) a thin temperature sensitive liquid crystal chip disposed in said chamber and exposed to said transparent wall,
(c) a heat sink plate lying against said chip on a side of said chip opposite said transparent wall, and
(d) a heat transfer pin having a tapering shank projecting from said housing for removable insertion into heart tissue and having an end within said housing in heat conductive contact with said heat sink plate.

4,509,533

FEVER THERMOMETER

Melvin Chervitz, E.Z. Temp, Inc., P.O. Box 27505, 12148 Lackland Rd., St. Louis, Mo. 63141

Continuation of Ser. No. 173,164, Jul. 28, 1980, abandoned, which is a continuation-in-part of Ser. No. 924,507, Jul. 14, 1978, Pat. No. 4,232,684. This application Sep. 20, 1982, Ser. No. 420,099
The portion of the term of this patent subsequent to Nov. 11, 1997, has been disclaimed.
Int. Cl.³ A61B 10/00
U.S. Cl. 128—736 **3 Claims**



1. A fever thermometer comprising:
(a) a flexible backing web having two opposing sides, the web provided with a background color,

(b) an adhesive on one side of the web for securing the web to the skin of the human body,

(c) a plurality of numerical display areas on the opposite side of the web, each numerical display area including an encapsulated liquid crystal indicator, the color spectrum of each liquid crystal indicator being responsive to a different specific temperature range, and the liquid crystal indicators being initially of a color to complement the background color so as to be substantially invisible at temperature below a minimum threshold temperature of the indicator having the lowest temperature range,

(d) a mask overlying the liquid crystal indicators, the mask being substantially the same color as the background color, and the mask being provided with windows disposed over and exposing the liquid crystal indicators to provide the numerical display areas,

(e) a directional indicator on the web for enabling adherence of the web with the numerical display areas in a predetermined attitude when the numerical display areas are substantially invisible at temperatures below the minimum threshold temperature so that the numerical display areas can be easily read when made visible at temperatures within the responsive ranges of the liquid crystal indicators, and

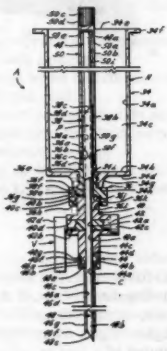
(f) the numerical display areas having liquid crystal indicators that indicate a fever condition being located at one side of the directional indicator, and the numerical display areas having liquid crystal indicators that indicate a non-fever condition being located at the opposite side of the directional indicator.

4,509,534

BLOOD WITHDRAWAL APPARATUS AND METHOD OF USING SAME

Myron J. Tassin, Jr., 732 Dalzell St., Shreveport, La. 71104

Filed Jun. 14, 1982, Ser. No. 388,419
Int. Cl.³ A61M *5/14*
U.S. Cl. 128—764 **16 Claims**



1. A blood withdrawal apparatus adapted to be mounted in flow communication with an intravenous catheter for collecting in a blood sample test tube samples of blood withdrawn through the intravenous catheter and an entry device, the intravenous catheter positioned in a vein of a subject receiving intravenous fluid and the entry device in flow communication with the intravenous fluid and the intravenous catheter, comprising:

a test tube housing formed having a test tube receiving chamber for receiving the blood sample test tube therein, said test tube housing having an open end and a closed end;

test tube penetration means within said test tube receiving chamber for penetrating the blood sample test tube when the blood sample test tube is properly positioned with said test tube receiving chamber;

valve means in flow communication with said test tube penetration means and mounted with said test tube housing for regulating the flow of blood to said test tube penetration means from the vein of the subject;

a connecting needle having a bore therethrough, said connecting needle having an upper end mounted with said valve means and said connecting needle formed having a blunt surface adjacent its lower end, said connecting needle being in flow communication with said valve means;

said test tube penetration means, said valve means, and said connecting needle are formed having bores that are axially aligned when said valve means is in an open position; and,

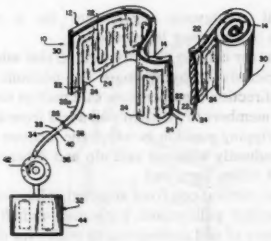
an inner cannula removably mounted substantially within said axially aligned bores formed in said test tube penetration means, said valve means, and said connecting needle for permitting ease of insertion of said connecting needle solely into the entry device, whereupon said inner cannula is removed for exposing said blunt surface on said lower end of said connecting needle.

4,509,535

ELECTRODE APPARATUS

Horace Bryan, 12 Brighton 10 La., Brooklyn, N.Y. 11235

Filed Jun. 7, 1982, Ser. No. 385,531
Int. Cl.³ A61N *1/04*
U.S. Cl. 128—798 **10 Claims**



1. An electrode apparatus for contacting a human body comprising: a planar flexible electrode assembly including a sheet of electrically non-conductive mesh-like material, first and second flexible electrically conductive wires incorporated into said mesh sheet along the length thereof in a spaced relationship through the interstitial spaces of said mesh sheet, a flexible planar cover sheet of electrically non-conductive material secured to one side of said mesh sheet, one of the terminal ends of each of said first and second wires being adaptable for selective connection to a source of electrical power at one end of the length of said mesh sheet, the other terminal ends of said first and second wires terminating at the other end of the length of said mesh sheet; the other side of said mesh sheet being adapted for contact application to a selected skin area of the human body.

4,509,536

TOBACCO STRIPPER

Jackie D. Bennett; Johnnie R. Bennett, both of Thompson Station, and Jimmie D. Bennett, Jr., Franklin, all of Tenn., assignors to 3-J-Co., Inc., Franklin, Tenn.

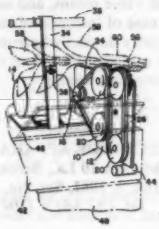
Continuation-in-part of Ser. No. 266,052, May 21, 1981,. This application Oct. 16, 1981, Ser. No. 312,144
Int. Cl.³ A01D *45/16*
U.S. Cl. 130—30 R **9 Claims**

1. An apparatus for stripping leaves from a tobacco stalk comprising:

(a) a base,

(b) first and second pulleys,

(c) a first endless belt entrained around said first pulley for rotary movement therewith,
(d) a second endless belt entrained around said second pulley for rotary movement therewith,
(e) mounting means supporting said pulleys on said base for rotary movement about parallel axes and closely adjacent each other to cause said first and second belts to converge into contiguous relationship to form a nip, each of said first and second belts having inner and outer leg portions,
(f) first and second belt guide members, said first belt passing around said first belt guide member, and said second belt passing around said second belt guide member,
(g) said mounting means supporting said first and second belt guide members so that said inner leg portions are in substantial contiguous engagement for a predetermined length of said inner leg portions,



(h) means for driving said first belt so that said substantially contiguously engaging inner leg portions move in the same direction together from said pulleys toward said belt guide members to grip and pull a leaf from a tobacco stalk in a stripping position in which the tobacco stalk is drawn longitudinally adjacent said nip and substantially parallel to said rotary axes, and
(i) at least one leaf cog fixed adjacent at least one of said first and second pulleys and projecting radially beyond the periphery of said corresponding pulley for drawing leaves from the tobacco stalk in said stripping position toward said nip.

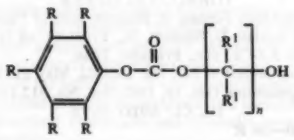
4,509,537

SMOKING COMPOSITIONS

Yoram Houminer, and Kenneth F. Podraza, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Apr. 4, 1983, Ser. No. 482,100
Int. Cl.[3] A24B *3/14*
U.S. Cl. 131—276 11 Claims

1. A smoking composition comprising an admixture of (1) combustible filler selected from natural tobacco, reconstituted tobacco and non-tobacco substitutes, and (2) between about 0.0001 and 2 weight percent, based on the total weight of filler, of a monocarbonate ester flavorant corresponding to the formula:



where R is a substituent selected from hydrogen, alkyl and alkoxy groups, R^1 is a substituent selected from hydrogen and alkyl groups, and n is an integer between 3 and about 10.

4,509,538

HAIR STREAKING IMPLEMENT

Vincent L. Ramik, 4966 Sabra Ln., Annandale, Va. 22003

Filed Mar. 16, 1984, Ser. No. 590,489
Int. Cl.[3] A45D *1/00*
U.S. Cl. 132—9 18 Claims

1. An implement particularly adapted for engaging groups of hair and withdrawing the groups through an associated frosting cap whereby the hair groups can be tinted, frosted, bleached or the like comprising a generally elongated body of one piece homogeneous copolymeric/polymeric material, a pair of generally oppositely directed hook portions carried one at each of axially opposite ends of said body, each hook portion including a shank and a hook, said hooks being of different sizes, said elongated body being formed in situ molded relative to said shank, and a cap housing each hook in partial external telescopic relationship to an associated one of said body ends whereby each cap can be selectively removed to expose the associated hook for withdrawing groups of hair as aforesaid.

4,509,539

HAIRPIECE WITH SIMULATED NATURAL HAIRLINE FRONT

Charles Alfieri, 250 East 63rd St., New York, N.Y. 10021

Filed Feb. 8, 1984, Ser. No. 578,205
Int. Cl.[3] A41G *3/00*
U.S. Cl. 132—53 10 Claims

1. A wear-durable hairpiece for covering an area on the scalp of a user, and for simulating a natural, visible hairline that appears to be growing directly out of the scalp at the front of the head of the user, comprising:
(a) a flexible, light-weight, shape-retaining lace mesh foundation constituted of a first set of spaced-apart fine fibers sonically bonded to a second set of spaced-apart fine fibers to strengthen the foundation and to retain the same in a predetermined shape which conforms to the contour of the scalp area to be covered, said second set extending transversely across said first set and bounding open spaces therewith, said foundation having an unbordered front region at the front of the head the user, said unbordered front region terminating at a non-frayable, unbound front edge which is defined by the ends of the fibers of the first and second sets;
(b) a multitude of hairs attached to the foundation substantially up to the front edge thereof, said attached hairs including a plurality of self-standing hairs knotted to the unbordered front region of the foundation along the front edge and extending in the immediate vicinity of the scalp in a generally vertically-disposed direction away from the

scalp at the front of the head of the user, said vertically-disposed, self-standing hairs being spaced apart from one another along the front edge to permit the scalp of the user to be visible through the open spaces of the foundation; and

(c) means for detachably securing the hair-attached foundation to the scalp area for repetitive covering of the same, and for positioning the vertically-disposed, self-standing, spaced-apart hairs along the front edge on the front of the head of the user to simulate a natural, visible hairline that appears to be growing directly out of the scalp at the front of the head of the user.

4,509,540

COSMETIC PUFF

Masaaki Inagaki, 4-2-27 Sakashita-cho, Hatogaya-shi, Saitama-ken, Japan

Filed Mar. 15, 1983, Ser. No. 475,408

Claims priority, application Japan, May 24, 1982, 57-74993[U]

Int. Cl.³ A45D *40/00*

U.S. Cl. 132—79 R **3 Claims**

1. A cosmetic puff for applying makeup to the skin of an individual by utilizing a dusting mode of application comprising:

a main body of appropriately soft material for dusting an individual's skin with makeup;

a grip rod for grasping by an individual and including a first end and a second end; and

spring means operatively connected to said main body and said first end of said grip rod, said spring means having a predetermined restoring force;

wherein said spring means transmits oscillating motion to said main body as said grip rod is actuated for dusting an individual's skin with makeup.

4,509,541

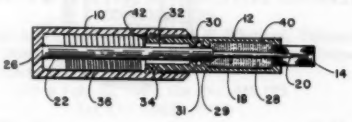
ANTISEPTIC TOOTHPICK

William D. Manciocchi, Jr., 803 Diamond St., Williamsport, Pa. 17701, assignor to William D. Manciocchi, Jr.; Lawrence S. Allison; Robert F. Griffin, Jr. and Steven J. Hall, all of Williamsport, Pa.

Filed Jun. 24, 1983, Ser. No. 507,745

Int. Cl.³ A61C *15/00*; B43K *5/16*

U.S. Cl. 132—90 **12 Claims**



1. An antiseptic toothpick comprising:

(a) a case including a base end and a top end, said case including internal wall threads;

(b) a hollow cylinder adapted to contain a liquid and including a base end and a top end and sealed at both ends, said cylinder threadably engaged on its external wall with case internal wall to give controllable telescopic action;

(c) a wick adapted to sealingly fit through said top end of said hollow cylinder to absorb and transmit liquid therethrough;

(d) a toothpick fastened to the internal center of said base end of said case and extending into and through said hollow cylinder and into a portion of said wick,

whereby, when through said telescopic action said hollow cylinder is retracted into said case, said toothpick protracts through said wick and into an exposed position and when said telescoping action is reversed, said toothpick retracts within said cylinder, leaving said wick available for use as an applicator.

4,509,542

COIN COUNTING AND PACKAGING MACHINE

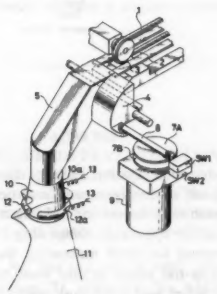
Kenkichi Watanabe, and Katusuke Furuya, both of Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jul. 22, 1982, Ser. No. 400,676

Claims priority, application Japan, Jul. 23, 1982, 56-115522

Int. Cl.³ G07D *9/04*

U.S. Cl. 133—8 A **2 Claims**



1. A machine for counting and packaging coins, which comprises:

a chute mouthpiece of an electrically conductive material attached to an outlet of a counting chute for discharging coins therethrough;

a ring of an electrically conductive material seated on the chute mouthpiece;

a coin bag of an electrically insulating material adopted to be capped on the chute mouthpiece between the ring and the chute mouthpiece;

means for generating a first signal when the coin bag is capped on the chute mouthpiece between the ring and the chute mouthpiece due to the electrical isolation of said ring from said chute mouthpiece, and for generating a second signal when the coin bag is not capped on the chute mouthpiece due to the electrical connection between said ring and said chute mouthpiece, the generating means being electrically coupled to said chute mouthpiece and said ring; and

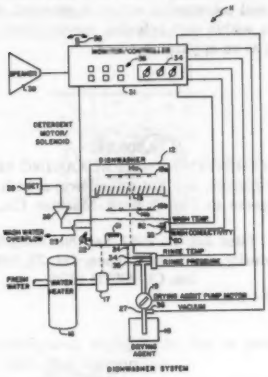
a control circuit for rendering the machine operable to cause the coins to be discharged into the coin bag, in response to the first signal of the generating means and for rendering the machine inoperable to prevent the coins from being discharged, in response to the second signal of the generating means.

4,509,543

INDUSTRIAL DISHWASHER MONITOR/CONTROLLER WITH SPEECH CAPABILITY

James W. Livingston, and James G. Schontzler, both of Santa Cruz, Calif., assignors to Beta Technology, Inc., Santa Cruz, Calif.

Filed Sep. 12, 1983, Ser. No. 531,753
Int. Cl.[3] B08B 7/04
U.S. Cl. 134—57 D 3 Claims



DISHWASHER SYSTEM

1. In a dishwasher system having rinse water receiving means, detergent receiving means and detergent dispensing means, and wash tank means for holding a quantity of water, monitor/controller apparatus comprising:

electrode means for both measuring the concentration of detergent in the water in said wash tank means and for detecting when said wash tank is empty;

detergent dispenser control means for activating said detergent dispensing means to add detergent to the water in said wash tank means when said electrode means detects that the concentration of detergent in the water in said wash tank is less than a preselected concentration value;

detergent fault means for detecting when the concentration of detergent in said wash tank does not reach said preselected concentration value after said detergent dispenser means has been activated for a preselected length of time and for transmitting a first speech message when said detergent fault is detected;

rinse water fault means for detecting when the temperature of water in said rinse water receiving means falls below a preselected minimum rinse water temperature value and for transmitting a second speech message when said rinse water temperature fault is detected;

rinse water detection means for detecting when water is flowing through said rinse water receiving means into said dishwasher; and

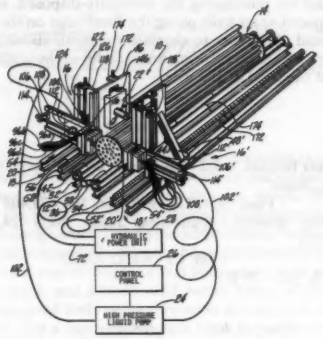
wash water purge fault means responsive to said electrode means and said rinse water detection means for detecting if the cumulative length of time that water has been flowing in said rinse water receiving means since the last time said wash tank means was empty exceeds a preselected dirty water delay period and for transmitting a third speech message when said purge fault is detected.

4,509,544

TUBE BUNDLE CLEANING APPARATUS

Gilbert L. Mains, Jr., 2767 Warwick Dr., Bloomfield Hills, Mich. 48013

Filed Aug. 29, 1983, Ser. No. 527,092
Int. Cl.[3] B08B 3/02, 9/02
U.S. Cl. 134—144 7 Claims



1. A tube bundle cleaning apparatus comprising:

a set of power-driven rollers adapted to receive a tube bundle for cleaning,

a horizontal track extending parallel to said rollers,

a carriage movably supported on said track,

a non-rotatable cleaning head adjustably mounted on said carriage and including plural nozzles, each pointed transversely of said bundle and adapted to be connected with a source of high pressure fluid,

first head positioning means for adjustably positioning said head on the carriage in the vertical direction,

second head positioning means for adjustably positioning said head on the carriage in the horizontal direction toward and away from said tube bundle,

nozzle positioning means for adjustably positioning each of said plural nozzles by translational movement relative to each other on said head,

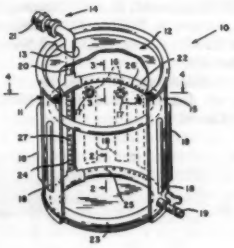
and means for moving the carriage along said track between the ends of said tube bundle.

4,509,545

PORTABLE WASHING AND SPRAY ASSEMBLY

Lamar S. Trotter, 210 Sixth St., Bridgeport, Conn. 06607

Filed Apr. 10, 1984, Ser. No. 598,538
Int. Cl.[3] B08B 3/02
U.S. Cl. 134—199 9 Claims



1. Portable washing and spray assembly designed to receive a continuous flow of cleaning liquid, such as water, and to circulate, wash and spray articles placed therein, said assembly comprising a container having a floor and a wall, at least one

overflow opening in said wall located a predetermined distance above said floor in order to maintain the volume of water within said container at a predetermined level, and a water supply attachment comprising a vertical conduit section communicating with and supporting a parallel pair of spaced horizontal conduit spray rings comprising a lower spray ring designed to be supported adjacent the floor of the container and being provided with a plurality of radial spray holes inclined upwardly at an angle between horizontal and vertical towards the center of the container, and an upper spray ring which is supported by said vertical conduit in a position spaced above said lower spray ring by a distance greater than the height of said overflow opening above the floor of said container, said upper spray ring being provided with a plurality of radial spray holes declined downwardly at an angle between horizontal and vertical towards the center of the container, said vertical conduit being designed to receive a continuous flow of water and to transmit said flow through said upper and lower spray rings and radial openings to fill said container to its overflow opening(s), to generate a water current from the bottom of said container upwardly towards the center thereof, and to generate a water spray from above the level of the water in the container towards the center thereof.

4,509,546

FIRESAFE SEAL

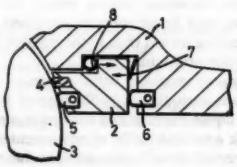
David A. Brookes, Orpington, England, assignor to The British Petroleum Company p.l.c., London, England

Filed Jul. 12, 1984, Ser. No. 630,065

Claims priority, application United Kingdom, Jul. 15, 1983, 8319185

Int. Cl.³ F16K *13/04*

U.S. Cl. 137—74 **6 Claims**



1. A sealing assembly comprising three non-compressible and relatively movable members, the first and second members having a first elastomeric, inflatable sealing element located between them, the second and third members having a second elastomeric, inflatable sealing element located between them to urge the second member away from the third member and towards the first member, spaces being provided between the second and third members and being occupied by an elastomeric spring biassed to urge the second member away from the first member and a metallic spring biassed to urge the second member towards the first member, the force exerted by the elastomeric spring being greater than and opposite to that exerted by the metallic spring.

4,509,547

CONTROL SYSTEM FOR AN ELECTRO-PNEUMATIC CONVERTER

Jane E. Smith, Mentor, and Rowland E. Whitford, Painesville, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Feb. 22, 1983, Ser. No. 468,105

Int. Cl.³ G05D *16/00*

U.S. Cl. 137—85 **10 Claims**

1. A closed-loop electro-pneumatic control system comprising:

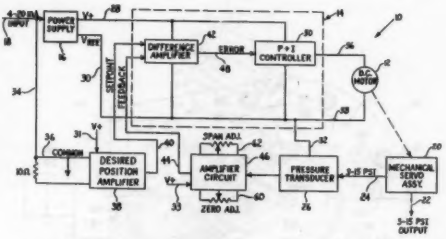
a mechanical servo assembly for providing a variable pneumatic output in response to a movable variable restriction;

motor means for moving said variable restriction of said mechanical servo assembly to vary the pneumatic output therefrom;

means for actuating said motor means in response to a control signal;

means for establishing a set point signal in response to an electrical input signal indicative of a desired pneumatic output signal;

means for establishing a feedback signal indicative of an actual pneumatic output signal;



combining means for comparing said set point signal with said feedback signal to establish a control signal to said actuating means; and

said motor actuating means and said combining means are powered by a pair of positive voltage sources established by a dual power supply to provide bi-directional rotation of said motor means without a negative power supply.

4,509,548

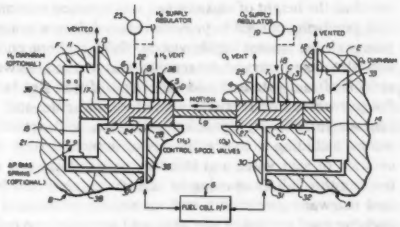
REACTANT PRESSURE DIFFERENTIAL CONTROL FOR FUEL CELL GASES

Albert P. Grasso, Vernon, Conn., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Continuation of Ser. No. 394,344, Jul. 1, 1982, abandoned. This application Aug. 31, 1984, Ser. No. 646,044

Int. Cl.³ H01M *8/04*

U.S. Cl. 137—99 **4 Claims**

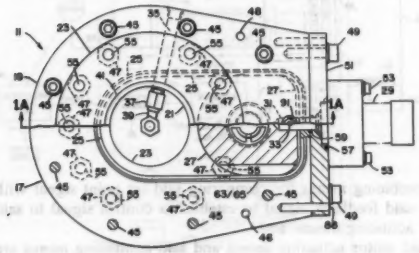


1. Means to control, vent and balance the supply of two separate reactant gases to a fuel cell comprising a control valve for each of said gases, separate flow path means for each of said gases for preventing intermingling of said gases, devices responsive to the pressures of the respective gases for actuating said valves, said valves being rigidly connected together so as to operate in unison for reciprocal adjustment of said gases, and dual vent means, one for each gas, operably associated with said valves for automatically accommodating major pressure unbalances between said gases.

4,509,549
HYDRAULIC POWERED GATE VALVE

Merton G. Cooper; William R. Kerns, both of Port Orchard; Daniel E. Filley, Bremerton, all of Wash., and Gary A. Koschnick, San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 12, 1982, Ser. No. 433,747
Int. Cl.³ F16K 3/30
U.S. Cl. 137—327 6 Claims



1. A gate valve comprising:

(a) a front plate, a back plate and a center plate, said front plate having a first opening for receiving or discharging a highly viscous fluid, said back plate having a second opening in alignment with said first opening for receiving or discharging said highly viscous fluid, said center plate having a slot, said center plate being positioned between said front and back plates wherein one end of said slot is in alignment with said first and second openings and the other end forms a rearward gate cavity between said front and back plates;

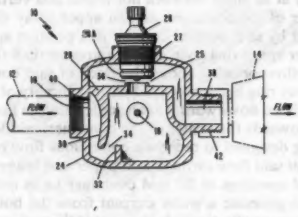
(b) a flat gate positioned within said slot and having a forward section, a flat rearward secion, a length, a width, a height, a top, and a bottom, said width of said gate being less than the width of said center plate, said length being less than the length of said gate cavity, said height being less than the height of said slot and said forward section of said gate being curved to provide reduced drag when said gate is closed against highly viscous fluid, said one end of said slot being curved to receive said curved forward section of said gate and said other end of said slot being flat to receive said rearward section of said gate; and

(c) means for slidably actuating said gate, said actuating means including a hydraulic device mounted onto the exterior of said valve and inluding an actuating rod extending through an opening in said center plate and into said rearward gate cavity and operatively connected to said rearward section of said gate, said actuating rod being operatively connected to said gate by a locking pin extending through a passage through the width of the gate in the region of said cavity and an aperture in the actuator rod, said front plate and rear plate have opposing passages facing said actuating rod for disposing removable plugs, said passages allowing access to said locking pin, whereby said actuating rod may be held immovable by apparatus secured in one of said opposing passages, said apparatus being inserted into the passage in the actuating rod to displace said locking pin and secure said actuating rod to said gate.

4,509,550
WATER TEMPERATURE DISPLAY AND FLOW CONTROL APPARATUS

Kermit R. Monk, 122 Oakland Dr., Cross Lanes, W. Va. 25313

Continuation-in-part of Ser. No. 411,097, Aug. 24, 1982, abandoned. This application Mar. 14, 1983, Ser. No. 475,444
Int. Cl.³ F03B 7/07
U.S. Cl. 137—551 15 Claims



1. Regulating apparatus for regulating a temperature of a liquid mixture provided as a mixture of two streams of liquid at first and second temperatures, comprising:

inlet means connected for providing said liquid mixture to the regulating apparatus;

a chamber within said regulating apparatus receiving said liquid mixture from said inlet means;

a temperature sensing means disposed within said chamber for detecting the temperature of said liquid mixture provided by said inlet means; and

flow control means, comprising a valve structure disposed at an outlet of said chamber, for controlling flow of said liquid mixture from said chamber to an outlet from said regulating apparatus

said inlet means including mixing means for more thoroughly mixing said liquid mixture provided to said temperature detecting means than in the mixture provided by a supply line for said liquid,

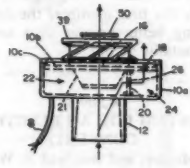
said mixing means comprising baffle means,

said baffle means including a baffle shaped for deflecting flow of said liquid mixture and for redirecting said flow, together with a second baffle means, oriented for receiving the redirected flow from said first mentioned baffle means and for further redirecting said flow towards said temperature sensing means.

4,509,551
BREATH SWITCH

Charles R. Luper, Anaheim, Calif., assignor to Sensormedics Corporation, Anaheim, Calif.

Filed Dec. 27, 1982, Ser. No. 453,414
Int. Cl.³ F16K 37/00
U.S. Cl. 137—554 8 Claims



1. A switch for indicating the beginning and ending of a pulsatile flow of gas comprising:

(a) a housing having an inlet and first and second outlets,

(b) means defining a first flow path for the flow of gas between the inlet and the first outlet,

(c) means defining a second flow path for the flow of gas between the inlet and the second outlet,

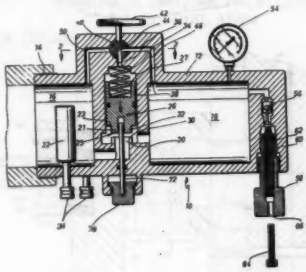
(d) a check valve including a flexible diaphragm connected in series with the first flow path,
(e) a flow responsive member connected in series with the second flow path and adapted to move in response to the flow of gas through the second flow path,
(f) means for indicating the position of said flow responsive member, and
(g) a vibration damping member attached to said flexible diaphragm.

4,509,552

GAS GUN FOR DETERMINING THE LIQUID LEVEL OF A WELL

Dean A. Eicher, Bellaire, and Fount E. McKee, Houston, both of Tex., assignors to Delta-X Corporation, Houston, Tex.

Filed Apr. 18, 1983, Ser. No. 486,128
Int. Cl.³ F16K *37/00*; G01L *19/02*
U.S. Cl. 137—557 **17 Claims**



1. A gas gun for producing pressure pulses for measuring the liquid level in a well comprising,
a body adapted to be connected to a well,
said body including first and second chambers interconnected by an intermediate passageway whereby a pressure pulse flowing between the chambers creates a pressure pulse for transmittal to a well, one of said chambers adapted to be connected to the well and one of said chambers adapted to be connected to a pressure source,
means in the body measuring pressure variations,
a piston actuated valve coupled to means for selectively opening and closing the passageway between the first and second chambers,
means for transmitting the higher pressure in one of the chambers to the piston for resiliently closing the valve, and
means for exhausting the pressure from the pressurized piston to the atmosphere for opening the valve and creating a pressure pulse between the chambers.

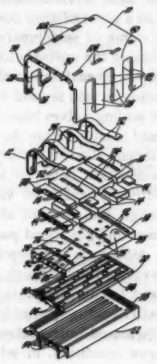
4,509,553

FLUID FLOW SELECTOR VALVE

Sangman Hahn, Kokomo, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sep. 2, 1983, Ser. No. 528,742
Int. Cl.³ F15B *13/08*
U.S. Cl. 137—596 **3 Claims**

1. A multimode slide valve comprising a complement of elongated side-by-side extending passages including a pressure potential passage and a plurality of communication passages, a plurality of groups of ports spaced along the length of said passages with the ports in each group being arranged in a prescribed pattern common to all the groups and so as to correspond with and be separately connected to said passages and with the number of said groups corresponding to a predetermined number of different modes of communication desired between said communication passages and said pressure potential passage and atmosphere, and individual slidable selector means for each said group slidable between a position blocking all the ports in the respective group and a position separately connecting said pressure potential passage and atmosphere with a prescribed number of said communication passages via



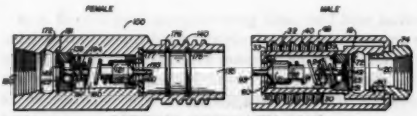
the ports in the respective group, said selector means having differently patterned passage means adapted to cooperate with the ports in the respective groups to provide the desired mode of communication including that with atmosphere to effect venting.

4,509,554

HIGH AND LOW PRESSURE, QUICK-DISCONNECT COUPLING

William G. Failla, 1 Rutgers Ct., Belleville, N.J. 07109

Continuation-in-part of Ser. No. 439,992, Nov. 8, 1982, abandoned. This application Sep. 19, 1983, Ser. No. 533,601
Int. Cl.³ F16L *37/08*
U.S. Cl. 137—614.05 **5 Claims**



1. An anti-vibration, high and low pressure, quick-disconnect, safety coupling, comprising:
(a) an elongate male element having a longitudinal axial bore comprising first and second regions, said regions each separated by an orifice, said male element further comprising a third annular region surrounding said second region, the outer circumference of said third annular region defining a circumferential housing of said elongate male element, the interior circumference of said third region comprising longitudinal locking means;
(b) an elongate female element having a longitudinal bore including first, second and third regions, each separated respectively by an orifice in which the external surface of a mating end of said female element comprises a longitudinal locking means with relationship to the locking means of the interior of the circumferential housing of said third annular region of said male element, said longitudinal locking means comprising means for securing said male and female elements into a plurality of respective axial positions, one of said axial positions defining a first locking mode between the locking means of said male and female elements, said first locking mode occurring prior to axial contact between any other elements of said male and female elements;

(c) a pair of inner-sealing valves having axial stems biased in a normally closed position, disposed upon a common axis of the respective male and female elements, said elements and said inner valves acting to define a second locking mode upon the axial advancement of said longitudinal locking means to a point of axial communication between the respective stems of said inner-sealing valves to the point of overcoming the normal closure bias of said inner valves to thereby open said inner valves, such open condition corresponding to said second locking mode; and

(d) a pair of outer sealing valves biased in a normally closed position, disposed axially within the respective orifices of each male and female element, axially opposite the regions of axial communication between said male and female elements respectively, said outer valves acting to enable fluid flow through said orifices after said inner valves have been opened and advanced past and second locking mode, thereby defining a third locking mode ultimately characterized by fluid flow through the entire axial length of said male and female elements, in which said third locking mode will occur only after both pairs of normally-closed, inwardly-biased outer valves have become actuated into an open condition, in which that outer valve exposed to the greater external fluid pressure will open only after the opening of the opposite outer valve, such later opening caused by the eventual overcoming of the normal inward pulling bias of said outer axial valve, this caused by the axial advance of the male and female elements toward each other, into said third locking mode,

whereby fluid flow toward said opposite valve through the entire coupling will occur in the direction of greatest fluid pressure.

4,509,555

DISK TRANSFER SYSTEM

James S. Stirbis, Littleton, Colo., assignor to Adolph Coors Company, Golden, Colo.

Continuation of Ser. No. 464,555, Feb. 7, 1983,. This application Feb. 10, 1984, Ser. No. 578,812

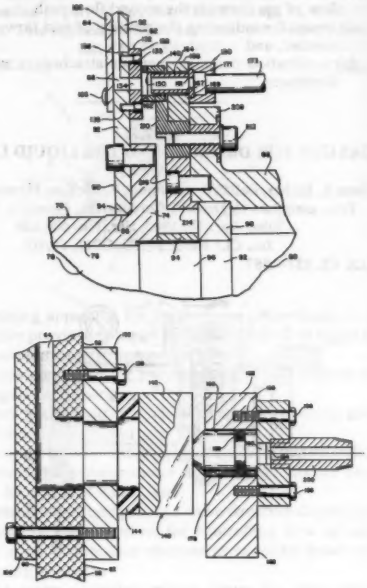
Int. Cl.[3] **F16K** *25/00;* **B65G** *47/04;* **B41F** *17/20*

U.S. Cl. 137—625.11 **1 Claim**

1. A system for connecting a plurality of circumferentially spaced ports on a rotating member to an air or vacuum chamber in a non-rotatable manifold member located in axially spaced juxtaposition to said rotating member which comprises:

mounting means for holding said manifold member in circumferentially fixed relationship to said rotating member while enabling axial movement of said manifold member relative to said rotating member; and

biasing means operatively associated with said manifold member for holding said manifold member in engagement with said rotating member while permitting limited axial displacement of said manifold member relative to said rotating member, said biasing means including a plurality of circumferentially spaced reciprocably mounted piston abuttingly engaging said manifold member and biasing said manifold member in a direction parallel to the direction of reciprocal movement of said reciprocally mounted piston means into engagement with said rotating member; and pressurized air means connected to said piston means for applying force thereon to hold said piston means in engagement with said manifold member while enabling



variable axial location of said piston means relative to said manifold member.

4,509,556

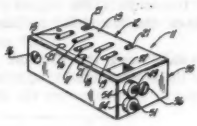
FLOW CONTROL FOR VALVE INTERFACE

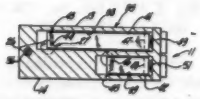
James E. Scanlon, Madison Heights, Mich., assignor to Ross Operating Valve Company, Detroit, Mich.

Filed May 13, 1982, Ser. No. 377,935

Int. Cl.[3] **F16K** *11/20*

U.S. Cl. 137—884 **7 Claims**





1. A flow control element for interpositioning in a fluid system comprising a valve body adapted to be interposed between a pair of elements of the system having fluid ports adapted to communicate with each other, said valve body having a pair of spaced flow ports extending through oppositely facing faces thereof and adapted to provide the communication between respective pairs of said element ports when

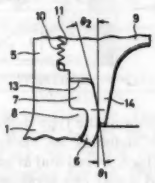
received therebetween, said flow ports having a non-cylindrical cross section comprised of parallel sides joined by rounded end portions, a pair of valve elements rotatably supported in said valve body and each extending across a respective one of said flow ports, said valve elements each having a semi-cylindrical portion of a diameter at least equal to the transverse dimension between said parallel sides of the respective flow control port transverse to the axis of said valve element and a relief in one side, each of said valve elements having a pin eccentrically affixed thereto and further including a pair of slidably supported valve operators each having a transversely extending slot receiving a respective one of said pins for rotating the respective valve element.

4,509,557

ACCUMULATOR

Nobuyuki Sugimura, 308 Mabase, Shimizu-Shi, Shizuoka-ken, Japan

Filed Jul. 8, 1983, Ser. No. 512,035
Int. Cl.³ F16L *55/04*
U.S. Cl. 138—30 **3 Claims**



1. A hydraulic accumulator of the type that comprises a pressure vessel having a threaded opening, its interior divided by resilient bladder into a gas compartment and a liquid compartment that are sealed from one another, and a threaded plug to removably fit into the opening of said pressure vessel, said accumulator being characterized by:

A. said bladder comprising an opening and a surrounding outwardly extending enlarged flange, said bladder having an inner surface defining the opening and having an inwardly radial upper surface on the flange and an adjoining tapered or curved opening periphery;

B. said pressure vessel having a detaining step upon which said flange of the bladder is placed to support the bladder;

C. said plug being provided with a radial surface and an adjoining downward projection to trap said bladder flange, said projection having an inwardly tapered or curved periphery having a shape mating with the shape of said bladder inner surface defining the opening, wherein said plug projection periphery will tightly contact with and compress said periphery of the bladder at the final moment of screwing down the plug radial surface against the bladder radial surface while providing a clearance between them at any stage other than that final moment so that the flange is not required to be forced to turn by the rotation of the plug.

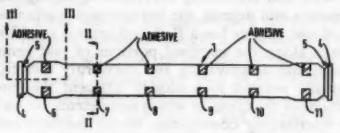
4,509,558

FLEXIBLE HOSE

Christopher J. Slater, Grimsby, England, assignor to Dunlop Limited, London, England

Filed Sep. 24, 1982, Ser. No. 423,266
Claims priority, application United Kingdom, Mar. 23, 1982, 8208402
Int. Cl.³ F16L *55/00*
U.S. Cl. 138—104 **8 Claims**

1. A flexible hose comprising a main fluid retaining carcass, a secondary fluid retaining carcass which encloses at least part of said main carcass and is capable of expanding radially relative to said main carcass in response to leakage of fluid from said main carcass and means to control radial expansion of said secondary carcass relative to said main carcass at positions



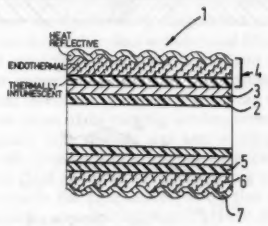
spaced axially along the length of the hose comprising a bonding of said secondary carcass to said main carcass at said positions spaced axially along the length of said hose.

4,509,559

FIRE-BARRIERS

Ivan C. Cheetham, and George A. Pope, both of Sutton Coldfield, England, assignors to Dunlop Limited, London, England

Filed Mar. 22, 1983, Ser. No. 477,663
Claims priority, application United Kingdom, Mar. 30, 1982, 8209258
Int. Cl.³ F16L *11/00*
U.S. Cl. 138—121 **14 Claims**



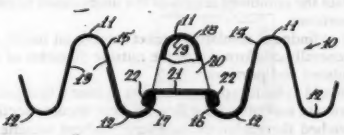
4. A flexible hose for conveying fluid, said hose having an outer cover comprising a flexible fire-barrier consisting of an outer layer of heat reflective material, an inner layer of thermally intumescent material compounded with elastomer, and an intermediate layer of endothermal material between said inner and outer layers.

4,509,560

LOCKING DETENT FOR CORRUGATED TUBE

Gunter Schafer, Ft. Lauderdale, Fla., assignor to Security Lumber & Supply Co., Bradley, Ill.

Filed Oct. 25, 1983, Ser. No. 545,189
Int. Cl.³ F16L *9/06*
U.S. Cl. 138—122 **2 Claims**



1. In a flexible corrugated tube of the type that has a succession of axially displaced convolutions of spirally coiled thin metal strip having longitudinally extending corrugations, the corrugations being of wave form having alternating arcuate axially spaced crests and troughs, the border portions of successive tube convolutions overlapping each other with at least one corrugation in the overlying border portion of one convo-

lution fitting into one corrugation of the underlying border portion of an adjoining convolution, and a plurality of circumferentially spaced detents in the crests of said interfitting corrugations with said interfitting corrugations having said wave form between said detents, the improvement comprising:

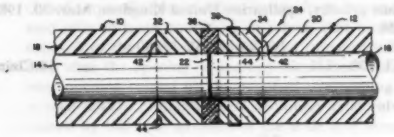
each of said detents has a flattened central area flanked by crimps along the marginal portions of said central area that extend downwardly and outwardly therefrom substantially parallel to a closely adjacent the lowermost portions of the crests in which said detents are located, so the overlapping convolution border portions are firmly locked into one another in said crimps.

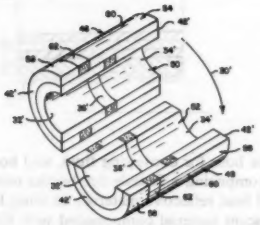
4,509,561

INSULATION DEVICE FOR APPLICATION TO AN UNINSULATED PORTION OF A PREINSULATED PIPE

Milton B. Litz, Pittsburgh, Pa., assignor to Power Piping Company, Pittsburgh, Pa.

Filed Apr. 28, 1983, Ser. No. 489,458
Int. Cl.³ F16L 9/14
U.S. Cl. 138—149 **13 Claims**





1. An insulation device for surrounding the combined lengths of the uninsulated, adjoining end portions of a preinsulated pipe, the end portions being so adjoined that a junction is defined thereby and the end portions having an outside diameter which is less than the outside diameter of the preinsulated pipe, comprising:

a plurality of axially extending cylinder segments molded from an insulating material and adapted to be circumferentially joined to form a cylindrical insulating jacket around the uninsulated end portions, said cylinder segments in their undeformed states having a length slightly greater than the combined length of the uninsulated adjoining end portions;

said cylindrical insulating jacket having an inside diameter generally conforming to the outside diameter of the uninsulated end portions;

each said cylinder segment having at least a first pair of rigid arcuate sections and a first resilient arcuate section sandwiched therebetween, said first resilient arcuate sections of all said cylinder segments being longitudinally positioned in said cylindrical insulating jacket to fall substantially in the same transverse plane; and

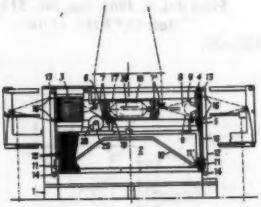
said first resilient arcuate section being made of such a resilient form of said insulating material that said first resilient arcuate sections of said plurality of cylinder segments are adapted to permit axial compression of said cylinder segments and, when said cylinder segments are so axially compressed, said first resilient arcuate sections are adapted to urge said cylinder segments to so axially expand toward resumption of their undeformed states that said cylindrical insulating jacket provides an expansion and contraction joint.

4,509,562

CIRCULAR LOOM

Johann Schönberger, Timelkam; Johann Bloo, Rosenau; Bruno Mistlberger, Vöcklabruck, and Johann Gehmaier, Gampern, all of Austria, assignors to Chemiefaser Lenzing Aktiengesellschaft

Filed Nov. 14, 1983, Ser. No. 550,943
Claims priority, application Austria, Nov. 11, 1982, 4100/82
Int. Cl.³ D03D 37/00
U.S. Cl. 139—13 R **2 Claims**



1. In a circular loom of the type including

a machine frame including an upper running race and a lower running race, a reed and at least one shuttle having a front end and a rear end arranged between said upper running race and said lower running race, running roller means arranged on said shuttle front end and on said shuttle rear end,

a rotor, and

a catch roller arranged on said rotor to drive said shuttle,

the improvement which is characterized in that said running roller means are adapted to support and guide said shuttle between said upper and lower running races and include a running roller arranged on said shuttle front end, and wherein said catch roller, during operation, is in contact with said running roller arranged on said shuttle front end, said catch roller being provided between said running roller means arranged on said shuttle front end and on said shuttle rear end.

4,509,563

DEVICE FOR THE INSERTION OF A WEFT THREAD INTO THE SHED BETWEEN TWO LINES OF WARP THREAD IN A WEAVING LOOM

Guy Gosciniak, Illfurth; Yves Juillard; Pierre Menissier, both of Mulhouse, all of France, and Albert Moessinger, Vaud, Switzerland, assignors to Mecaniques de Mulhouse Societe Alsacienne de Constructions, France

Continuation-in-part of Ser. No. 239,577, Mar. 2, 1981, abandoned. This application Sep. 30, 1983, Ser. No. 537,844
Int. Cl.³ D03D 47/12, 47/36
U.S. Cl. 139—443 **15 Claims**

1. Device for the insertion of a weft thread into the shed of a weaving loom comprising:

a delivery system;

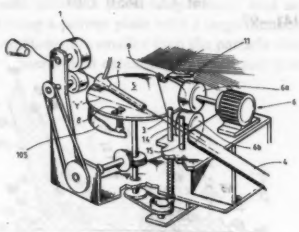
a thread collecting unit for receiving thread from the delivery system;

an insertion system, placed between the delivery system and the thread collecting unit for inserting a pick of weft thread into the shed between the warp threads;

a feeding system which is adapted to be driven to cooperate with said insertion system to transfer a pick of weft thread from the thread collecting unit to the insertion system;

said feeding system including:

driving means adapted to be moved during driving of the feeding system through a set path which is outside the operative zone of the insertion system but which intersects the trajectory of thread between the delivery



system and the thread collecting unit, and gripping means mounted on the driving means adapted to engage such a pick of weft thread and carry the thread into the operative zone of the insertion system for insertion thereby.

4,509,564

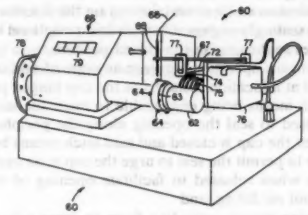
METHOD FOR WINDING ANNULAR ZIG-ZAG WINDINGS

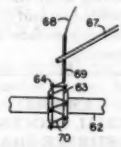
Richard D. Sedgewick, 100 Horne St., Dover, N.H. 03820

Division of Ser. No. 342,647, Jan. 25, 1982, Pat. No. 4,399,843, which is a division of Ser. No. 198,928, Oct. 20, 1980, Pat. No. 4,331,896. This application Apr. 18, 1983, Ser. No. 485,737

Int. Cl.³ B21F *3/00*

U.S. Cl. 140—92.2 **6 Claims**





1. A method of winding multi-phase annular zig-zag windings comprising:

rotating a winding arbor having a winding surface for receiving coil forming wire in an annulus around the rotating arbor and a plurality of pins spaced apart around the arbor in at least two opposite rings of pins defining the opposite perimeters of the annular winding to be wound, said pins mounted in the winding arbor forming acute angles with the winding surface of the arbor, each ring of pins oriented with the acute angles in the direction away from the other ring of pins;

reciprocating back and forth a wire feed winding arm over the winding surface in a span greater than the spaced apart rings of pins and delivering coil winding wire to the winding surface in timed relationship to the rotation of the winding arbor;

winding a first annular zig-zag winding element of a multi-turn filament bundle of troughs and peaks by feeding the coil winding wire onto the winding surface of the rotating arbor around spaced apart pins of alternately opposite rings of pins on the winding arbor during multiple turns of the rotating arbor and packing and holding the multiple turns of the filament bundle together on the winding surface at the troughs and peaks in the acute angles of the pins;

advancing the phase of the rotating winding arbor relative to the reciprocating wire feed winding arm and winding a second annular zig-zag winding element of a multi-turn filament bundle of peaks and troughs over the first annular zig-zag winding element and offset from the first winding element so that the troughs of the second winding element are approximately aligned with the peaks of the first winding element, by feeding the coil winding wire onto the winding surface of the rotating arbor around spaced apart pins of alternately opposite rings of pins on the winding arbor during multiple turns of the rotating arbor and packing and holding the multiple turns of the filament bundle together at the peaks and troughs in the acute angles of the pins, thereby laying the second winding element over the first winding element as adjacent multi-filament bundles, rather than as individual filament cross-overs and providing a first phase in the form of a ring of equivalent current loops oriented with orthogonal axes along radial directions of the annular zig-zag winding:

advancing the phase of the rotating winding arbor relative to the reciprocal wire feeding arm and winding a second phase in the form of a ring of equivalent current loops comprising third and fourth annular zig-zag winding elements wound in the same manner as the first and second zig-zag winding elements but formed around different pins offset in phase from the first and second zig-zag winding elements thereby providing a multi-phase annular zig-zag winding.

4,509,565

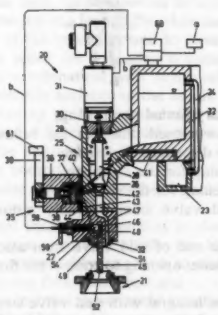
FILLING ELEMENT FOR SINGLE-CHAMBER AND MULTI-CHAMBER COUNTERPRESSURE FILLING MACHINES

Egon Ahlers, Neu-Bamberg, Fed. Rep. of Germany, assignor to Seitz Enzinger Noll Maschinenbau AG, Bad Kreuznach, Fed. Rep. of Germany

Filed Oct. 14, 1982, Ser. No. 434,257

Int. Cl.³ B67C *3/06*

U.S. Cl. 141—39 **7 Claims**



1. A filling element for single-chamber and multi-chamber

counterpressure filling machines, said filling element comprising:

a filling element body which is provided with a liquid guidance conduit;

a controlled, pressurized gas valve arrangement associated with said filling element body for producing a gas pressure in a pressed-on container which is to be filled prior to liquid flowing therein;

a liquid flow valve provided in said filling element body for opening and closing said liquid guidance conduit;

an actuating device for effecting opening and closing of said liquid flow valve, and hence of said liquid guidance conduit;

an electrical switching member for generating a closure-control signal, upon contact of said member with liquid rising in a pressed-on container, for having said actuating device assume a closing position; said switching member being electrically insulated relative to said liquid guidance conduit, and being a rod-shaped probe of electrically conductive material over its entire length;

an electrical connection which is electrically connectible with said actuating device and with said probe; said filling element body being made of electrically insulating material from that end of said liquid guidance conduit thereof which would be closest to a pressed-on container, to at least beyond said electrical connection; and

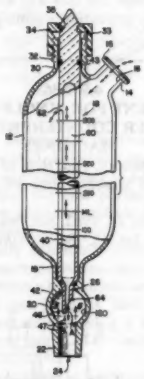
a holder located below said liquid flow valve in that part of said filling element body made of electrically insulating material for fixing the position of said probe and for shielding said probe from contact with liquid in said liquid guidance conduit.

4,509,566

SEPARATORY FUNNEL AND VALVE DEVICE

Edwin D. Phillips, 700 Cedar Ave., Middlesex, N.J. 08846

Filed Jul. 21, 1983, Ser. No. 515,860
Int. Cl.³ B01L *3/00*
U.S. Cl. 141—94 **22 Claims**



1. A separatory funnel comprising:

an enlarged enclosed chamber for holding liquids to be accurately dispensed therefrom;

an inlet opening for the chamber;

an outlet opening for the chamber;

an elongated valve stem movably mounted within said chamber;

means at one end of said valve stem associated with said chamber outlet opening to control the flow of liquid therefrom; and

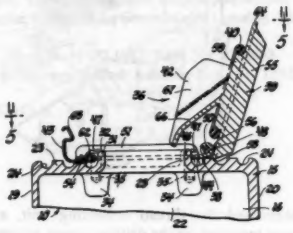
further means integral with said valve stem to permit fluid flow through the stem separate from the path of controlled liquid flow from said chamber outlet opening.

4,509,567

OIL FILTER AND CAP

Bobby J. Harrison, Ortonville, and Peter Ashurkoff, Grand Blanc, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 2, 1983, Ser. No. 490,477
Int. Cl.³ B65B *3/04*
U.S. Cl. 141—97 **5 Claims**



3. An engine oil filler and cap comprising

means defining an exterior wall of an oil containing chamber of such engine, said wall having an oil fill opening therethrough with a sealing surface peripherally surrounding said opening and said wall having a side portion extending in generally planar relation with the peripheral surface outward of one side of the peripheral surface,

a filler cap hinged to said exterior wall along said side portion thereof and pivotable between a closed position generally parallel with said wall and covering said opening and an open position extending at an angle with said wall and permitting access to said opening to pour oil therethrough into said chamber,

a continuous resilient seal carried on the interior of said cap and sealingly engageable with said peripheral wall surface when said cap is in the closed position,

latch means operative between an edge of said cap and said wall at a location distal from the cap hinged portion, said latch means being engageable to maintain said seal compressed to seal the opening along the peripheral surface when the cap is closed and said latch means being releasable to permit the seal to urge the cap in an opening direction when released to facilitate opening of the cap and permit oil filling, and

a pouring trough extending from an inner side of said cap within said seal, said trough extending through said opening and behind said wall side portion when the cap is in the closed position, and said trough extending above said cap and sloping downwardly over said peripheral surface and above said opening when the cap is in the open position, whereby oil poured on said trough is prevented from contacting the main cap surface and is directed by said trough into said opening.

4,509,568

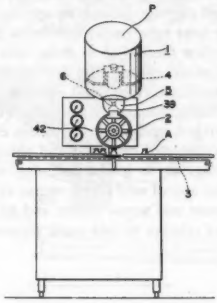
GRANULAR MATERIAL PROCESSING APPARATUS WITH SEAL FOR STIRRER SHAFT OR THE LIKE FORMED BY THE GRANULAR MATERIAL

Toshihiro Kawaguchi, Osaka; Mineo Ishizaka, Hikari, and Hiyoshi Doi, Izumisano, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Jun. 8, 1983, Ser. No. 502,232
Claims priority, application Japan, Dec. 10, 1982, 57/217380
Int. Cl.³ B65B *43/42*
U.S. Cl. 141—129 **5 Claims**

1. A granular material processing apparatus which comprises a stationary container means for storing and transferring granular material, a movable processing means adapted to be coupled with a driving means for stirring and dispensing the granular material, said stationary container means and said

movable processing means each having at least one part provided adjacent to a corresponding part on the other so as to constitute part of said processing apparatus and having a gap therebetween, and a sealing arrangement for preventing leakage of the granular material from the stationary container means through the gap between said stationary container means and said movable processing means, said sealing arrangement having a porous plate with a large number of pores therein having diameters smaller than the particle diameters of the granular material and extending through said porous plate



from a front face to a rear face thereof, and which porous plate is positioned on the surface of a portion of said stationary container means part in spaced opposed relation to said movable processing means part, and a pressure reduction introducing space provided between said stationary container means and said porous plate to which the rear face of said porous plate is exposed, and a pressure reducing means communicated with said space, whereby a granular material attracted onto the front face of said porous plate by the reduced pressure in said space tightly closes the gap between said stationary container means and said movable processing means.

4,509,569

ARRANGEMENT FOR SUPPLYING GAS TO A LIQUID IN A CONTAINER THEREFOR

Bengt O. Adolfsson, Stockholm, Sweden, assignor to Kommanditbolaget Aldolf, Västerås, Sweden

PCT No. PCT/SE82/00183, § 371 Date Jan. 24, 1983, § 102(e) Date Jan. 24, 1983, PCT Pub. No. WO82/04243, PCT Pub. Date Dec. 9, 1982

PCT Filed May 19, 1982, Ser. No. 463,451

Claims priority, application Sweden, May 25, 1981, 8103281

Int. Cl.³ B65B *3/04*

U.S. Cl. 141—360 **10 Claims**

1. A pressurized apparatus for domestic use for carbonating and dispensing water, comprising:

(a) a water container (2; 30),

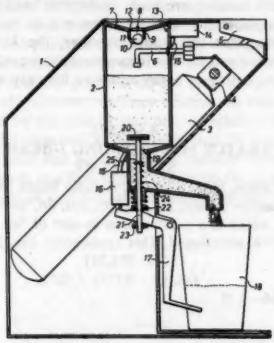
(b) a closeable fill orifice (8) for introducing water into the container,

(c) means (3, 4, 5, 6) for supplying pressurized carbon dioxide gas to the container through a discharge outlet disposed below a highest level to which the container may be filled with water,

(d) a normally closed discharge orifice (19; 31) for dispensing carbonated water from the container,

(e) a gas venting orifice (13) disposed in an upper portion of the container above said highest level,

(f) dispenser actuation means (17; 43) for enabling the opening of the discharge orifice, and



(g) means for preventing the opening of the discharge orifice upon the enablement thereof when the pressure in the container exceeds a predetermined value.

4,509,570

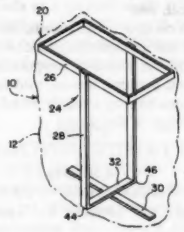
ELASTIC TOP BAG

Jeffrey Eby, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Bldg., 233 Broadway, both of New York, N.Y. 10007

Filed Jan. 24, 1983, Ser. No. 460,748

Int. Cl.³ B65B *43/26*

U.S. Cl. 141—390 **1 Claim**



1. An elastic top trash bag which comprises:

(a) a trash bag having an opening at the top;

(b) an elastic band placed around the top of the trash bag, the trash bag having edges of the top folded over the elastic band and sealed forming a hem so that the elastic band is held within the hem, the hem serves to hold the trash bag in place around top of a receptacle when the hem is folded over the top of the recepticle and to close the trash bag automatically when the trash bag is removed from the recepticle, in combination with removeable collapsible frame for internally supporting the bag in open position, said means having portions detachable for purposes of being collapsed wherein the trash bag is made out of plastic and the elastic band is made out of rubber, said frame further comprises:

(a) a rectangular top frame member to hold the hem in an open position;

(b) a U-shaped frame member that is placed within the trash bag in a vertical position, the U-shaped frame member is removeably attached to and supports the rectangular top frame member; and

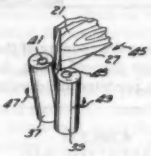
(c) a bar frame member removeably attached transverse to bottom of the U-shaped frame member so that the trash bag can be supported in an open position to be filled

without utilizing the receptacle wherein the rectangular top frame member, the U-shaped frame member and bar frame member are made of durable hard plastic and are collapsible for storage when not in use wherein the rectangular top frame member, the U-shaped frame member and the bar frame member are attached to each other with peel away adhesive for easy assembly.

4,509,571
APPARATUS FOR FORMING I-BEAM TRUSS STRUCTURE

Dierk D. Peters, P.O. Box 137, Rancho Santa Fe, Calif. 92067

Continuation of Ser. No. 60,908, Jul. 26, 1979, Pat. No. 4,336,678, which is a continuation-in-part of Ser. No. 927,618, Jul. 24, 1978, abandoned. This application Jun. 23, 1982, Ser. No. 391,231
Int. Cl.³ B27M *1/02*
U.S. Cl. 144—2 R **12 Claims**



4. A forming device for impressing indentations of a selected shape or pattern into a surface of a sheet of wood adjacent an edge thereof, comprising:

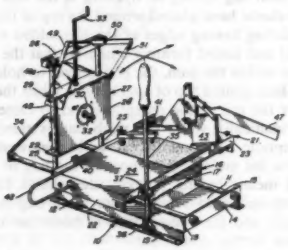
roller means rotatably mounted for engaging the edge of a sheet of wood; and

forming means on said roller means, having a surface shape and pattern for compressing the wood and leaving an impression on the wood corresponding to the shape and pattern of said forming means, said forming means forming impressions having a depth which generally increases toward the edge of the wood.

4,509,572
WOODWORKING PRESS

Germain L'Archer, 866 Lamarre St., Laprairie, Canada J5R 1N7

Filed Jun. 17, 1983, Ser. No. 506,396
Int. Cl.³ B27F *5/00*; B27C *5/00*
U.S. Cl. 144—84 **5 Claims**

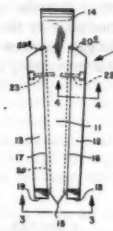


1. A woodworking press comprising a base, superposed lower and upper carriages slidably mounted on said base and on said lower carriage respectively for horizontal guided displacement at right angles one with respect to the other relative to said base, said upper carriage forming a horizontal work supporting surface, a single generally upright actuation arm pivoted to said base at its lower end about a first universal joint and to said top carriage about a second universal joint, said arm also longitudinally slidable relative to said second universal joint, actuation of said arm causing movement of said upper carriage in any horizontal direction, a pair of upright spaced support rods fixedly secured to said base, upwardly projecting therefrom and located exteriorly of the area of displacement of said upper and lower carriages, a top cross bar interconnecting the ends of said support rods, a third plate-like carriage slidably mounted on said support rods for vertical movement therealong, said third carriage having a back surface and a front surface, the latter facing towards said upper and lower carriages, said third carriage having an aperture made therein, a power-driven router removeably secured to said third carriage at the back surface thereof so as to be movable therewith, a horizontally disposed cutting tool operatively carried by said router and extending through said aperture of said third carriage and protruding from said front surface towards the upper and lower carriages, upright screw means extending through and screwed within said cross bar and rotatively attached to said third carriage at its lower end, and manually actuable means at the top end of said screw means exposed above said cross bar to rotate said screw means and adjust the height of said cutting tool relative to said work supporting surface.

4,509,573
CONVERTIBLE LOG SPLITTING DEVICE

Kenneth R. Santmyer, Jr., 294 Valley Rd., Furlong, Pa. 18925

Filed Oct. 27, 1983, Ser. No. 545,790
Int. Cl.³ B27L *7/00*
U.S. Cl. 144—193 D **1 Claim**



1. A splitting wedge for use in splitting a log, comprising:

an elongated wedge body having tapered sides extending between a driving head at one end and a major edge at the opposite end,

a pair of quartering members extending lengthwise of said wedge body along opposite sides thereof and having auxiliary edges extending orthogonal to said major edge a spaced distance upwardly therefrom,

interengaging surfaces extending lengthwise in said wedge body and on each quartering member for slidably mounting said quartering members to said wedge body, said surfaces defining a dovetail groove extending in each tapered side of said wedge body and a shaped tongue on each quartering member,

abutment surface means in said groove on the wedge body and on said tongue of each quartering member adjacent its upper end for engaging one another to transfer pressure from the wedge body to each quartering member, and

fastener means releasably coupling said quartering members to said wedge body,

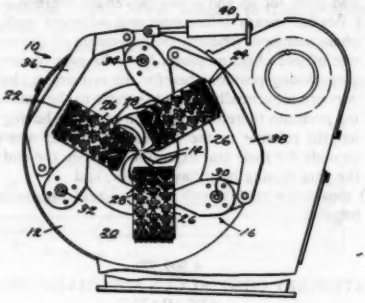
whereby the cutting wedge may be used to split logs into various shapes.

4,509,574

FEED ROLL SPIKES WITH PLUS-SHAPED CUTTING EDGES

Walden M. Gaitten, deceased, late of Sylacauga, Ala. (by Dorothy A. Gaitten, executrix), assignor to Kockums Cancar, Corp., Talladega, Ala.

Filed Dec. 9, 1983, Ser. No. 559,815
Int. Cl.[3] B27L *1/00*
U.S. Cl. 144—208 E 18 Claims



1. In a debarking machine of the type including an annular frame, a plurality of debarking tools, means mounting said tools in annularly spaced relation within said annular frame for rotation together about the axis of said annular frame and for movement toward and away from each other, infeed and outfeed mechanisms for feeding logs through said annular frame so that said tools will engage the exterior periphery of the successive logs and strip the bark therefrom during their movement through the annular frame, said infeed mechanism including three driven infeed spiked rolls arranged so that their spiked peripheries normally engage the exterior periphery of the log in centered relation and move the same axially through said annular frame for debarking by said tools, each of said spiked rolls including a cylinder and a multiplicity of spikes extending radially outwardly therefrom, the improvement which comprises:

each of said spikes in at least one of said rolls being constructed so as to provide a radially outward cutting edge disposed generally within a plane parallel with the plane of said cylinder, said cutting edge being configured to define at least one line extending transverse to the direction of movement thereof on said roll and a second line extending transverse to said first line, said spike divergingly tapering from said lines in a direction toward the exterior of said cylinder.

4,509,575

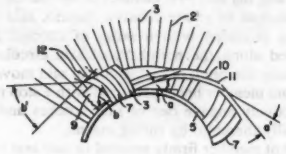
PNEUMATIC VEHICLE TIRE

Heinrich Funk, Burgwald; Henryk Pakur, Bückeburg, and Hans Seitz, Langenhagen, all of Fed. Rep. of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed Apr. 12, 1984, Ser. No. 599,533
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1983, 3313854
Int. Cl.[3] B60C *15/06, 9/08*
U.S. Cl. 152—356 R 7 Claims

1. A belted pneumatic vehicle tire having a radial carcass with strength carriers which are anchored in the tire beads by being looped around the bead cores thereof; each carcass strength carrier is provided with a portion which extends uninterrupted from one bead to the other, and with two end portions, each of which is disposed laterally, respectively axially, outwardly of the associated bead core, and is guided radially outwardly from the associated bead; also provided are bead reinforcers composed of filaments which are disposed in a cord ply and extend at an incline to the radial direction of said tire;

the improvement comprises the arrangement of said filaments of said bead reinforcers, and of said strength carriers of said end portions of said carcass, with said filaments of said bead reinforcers on the one hand, and said strength carriers of said end portions on the oher hand, extending at oppositely directed inclines relative to radial planes determined by the axis of said tire, or relative to the circumferential direction of said tire; each of said strength carriers of said end portions has a radially outer portion which extends at a first angle relative to the circumferential direction of said tire, and a portion in the vicinity of



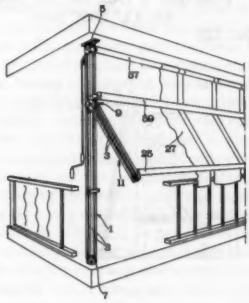
the associated bead core which extends at a second angle relative to the circumferential direction of said tire, with said first angle of said radially outer portion of each strength carrier being less than said second angle of said bead core portion of each strength carrier in the end portion of the latter; each of said filaments of said bead reinforcers has a radially outer portion which extends at a first angle relative to the circumferential direction of said tire, and a portion in the vicinity of the associated bead core which extends at a second angle relative to the circumferential direction of said tire, with said first angle of said radially outer portion of each filament being less than said second angle of said bead core portion of each of said filaments.

4,509,576

SUNSHADE FITTING CONVERTIBLE INTO VERANDA CURTAIN FITTING

Serafini Giovanni, via Fiocchetto 33, 10152 Turin, Italy

Filed Oct. 24, 1983, Ser. No. 544,609
Claims priority, application Italy, Nov. 9, 1982, 68310 A/82
Int. Cl.[3] E04F *10/06*
U.S. Cl. 160—66 3 Claims



1. A sunshade fitting convertible into a veranda curtain fitting comprising:

a supporting column made of an appropriately longitudinally grooved sectional member secured to the ceiling and floor of the terrace to which the curtain is to be applied, each of said columns being provided with an upper link

member for connection to the ceiling by means of a plate with dowels and bolts, and a lower link member having an adjustable foot supported on the floor;

an arm forming a single body with the supporting column, but pivotally mounted relative thereto, to pivot about a center of rotation located at a suitable height in the vicinity of the middle or the medium third of said column;

a pivot means provided adjacent said arm for rotation in an appropriate seat and adapted to regulate by said rotation the height of the curtain supporting arm secured thereto, said pivot means being formed by coupling two members one of which is flat and firmly secured to the column and has a substantially circular profile projecting outwardly from said column and the other is firmly secured to said arm and fits said first member in the manner of a jaw and is adapted to rotate relative thereto, said first member being provided with a series of notches appropriately spaced along the periphery of said circular profile and defining the pitch of inclination of said movable arm, said second member being provided with a stop pin adapted to selectively engage one of said notches and being urged radially thereinto by spring means;

said pivot member firmly secured to said arm being laterally provided with at least two grooves adapted to be aligned alternately with a longitudinal groove provided laterally on said column, one groove forming a slideway for a curtain supporting lower end rod, when the curtain is to be extended along said arm in the sunshade position and the other groove forming a slideway for said curtain supporting lower end rod when said rod is to be moved downwardly to the end of said longitudinal groove in said column in the veranda curtain position;

said grooves in said column and arm being provided at their ends with a labyrinth locking track for locking the drawn curtain in position and facilitating its extraction for lifting;

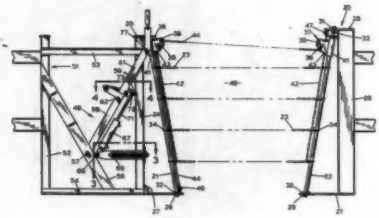
said curtain supporting lower end rod being provided at its two ends with a lever member freely pivotally mounted on an appropriate pivot on the axis of said rod and adapted to move along said grooves in said column and arm, said pivot supporting at its free end another pivot adapted to move along said labyrinth track, the movability of said pivot arranged at the free end of said lever member permitting said curtain supporting lower end rod to be locked and unlocked for lowering and lifting the curtain.

4,509,577

CHAIN GATE STRUCTURE

Marvin J. Priefert, Mount Pleasant, Tex., assignor to Priefert Mfg. Co., Inc., Mount Pleasant, Tex.

Filed Nov. 7, 1983, Ser. No. 549,161
Int. Cl.³ E05C *5/00*
U.S. Cl. 160—328 **5 Claims**



1. A chain gate for a gateway defined by a pair of upright horizontally spaced anchor members comprising:

(a) a chain structure for opening and closing said gateway including a pair of end posts corresponding to said pair of anchor members with each end post located adjacent to and inwardly of an associated anchor member and inclined upwardly and toward the anchor member,

(b) means for securing each end post to an adjacent anchor member,

(c) a plurality of chain members extended between said end posts in a vertically spaced relation to raised positions therefor to close said gateway with the uppermost one of said chain members adjacent the upper ends of said end posts, and to lowered positions extended between the lower ends of said end posts to open said gateway,

(d) means connecting the ends of said chain members to said end posts for up and down movement thereon,

(e) flexible means interconnecting adjacent ends of said chain members whereby on movement of the uppermost one of said chain members from the gate opening to the gate closing position therefor the remaining chain members are sequentially moved thereby to the gateway closing positions therefor, said chain members having varying lengths relative to the inclination of said end posts to provide for their taut extension between the end posts in the gate closing positions therefor, and

(f) means for raising and lowering said uppermost chain member.

4,509,578

STATIONARY CONTINUOUS AUTOMATIC POURING APPARATUS

Daniel Shaw, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Feb. 12, 1982, Ser. No. 348,287
Int. Cl.³ B22D *11/16*
U.S. Cl. 164—155 **3 Claims**

3. Automatic metal casting apparatus comprising:

a plurality of molds, said molds each having a cavity for shaping a melt and a pouring basin extended in the direction of mold travel for receiving said melt from a vessel and directing it into said cavity;

mold translating means for successively transporting each mold in a predetermined path adjacent a metal melt dispensing vessel;

a vessel for holding said melt in substantially stationary position above said path and dispensing said melt to said molds, said vessel having a floor defining its lower extremity;

first and second melt discharge outlets in said floor, said outlets being spaced one from the other in the direction of said mold travel and adapted to sequentially dispense melt to each said mold as it passes beneath the outlets;

first and second valve means operatively associated with said first and second outlets respectively so as to permit melt flow when open and restrict melt flow when closed;

first and second actuator means for opening and closing said first and second valve means respectively;

sensing means for determining the location of a mold to be poured with respect to said outlets;

control means responsive to said sensing means for energizing said first and second actuator means in sequence such as to incrementally fill each mold with melt from each said outlet as it passes beneath said outlets, said sequence being such as (1) to open said first valve when said first outlet is aligned with said basin, (2) to open said second valve when said second outlet is aligned with said basin, (3) to close said first valve before said first outlet comes out of alignment with said basin, and (4) to close said second

valve before said second outlet comes out of alignment with said basin; and

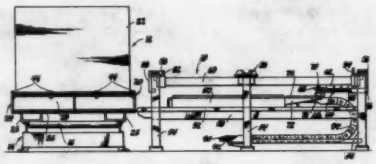
means for translating said vessel in a direction transverse said path for dumping such melt in said vessel as can no longer effectively be poured into said molds.

4,509,579

APPARATUS FOR FLUIDIZING A PARTICULATE BED WITHIN A FLASK

Frank G. Pirrallo, Fraser, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 20, 1984, Ser. No. 622,476
Int. Cl.³ B22D *21/12, 19/00*
U.S. Cl. 164—159 **2 Claims**



1. A fluidization gas delivery apparatus for use in conjunction with a flask containing a particulate bed to subject said particulate bed to a forceful gas flow to fluidize the bed, said flask comprising a gas-permeable partition for admitting fluidizing gas to the bed and having an open chamber providing access to the partition opposite the particulate bed, said permeable partition being susceptible to plugging by contaminants entrained in gas flowing therethrough, said apparatus comprising

a plenum box receivable within the flask chamber adjacent the permeable partition and defining a plenum having a gas outlet, said plenum box being reciprocal between an outboard position wherein the box is independent of the flask and an inboard position wherein the box is received within the flask chamber with the plenum outlet facing the partition,

seal means disposed about the plenum outlet for forming a peripheral hermetic seal when urged against the flask partition,

means for reciprocating the plenum box between the inboard and the outboard positions, said box reciprocation being facilitated by suitable clearance provided between the flask partition and the seal means,

lift means mounted upon the plenum box and operative for raising the box within the flask chamber relative toward the partition to urge the seal means against the partition to form the peripheral seal about the plenum outlet,

filter means mounted upon the plenum box coextensive with the plenum outlet for removing contaminants from gas flowing from the plenum, and

means for introducing pressurized gas into the plenum when the plenum box is peripherally sealed against the flask permeable partition to thereby cause gas to flow from the plenum through the filter and thereafter through the permeable partition into the particulate bed to produce fluidization, said filter removing contaminants entrained in the gas to reduce plugging of the flask partition.

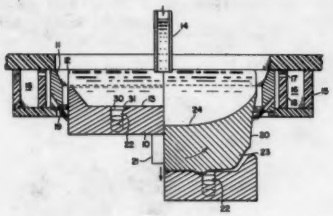
4,509,580

BOTTOM BLOCK

David G. Goodrich, Danville, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Dec. 9, 1982, Ser. No. 448,084
Int. Cl.³ B22D *11/08*
U.S. Cl. 164—445 **11 Claims**

1. A bottom block for use in the vertical DC or EM continuous casting of large elongated ingots or billets, said block having a dish-shaped upper surface provided with a plurality of drain holes, said drain holes being adapted to remove coolant that collects on the said upper surface from said surface and recess means associated with at least certain of said drain holes for directing coolant to the drain holes and alleviating sticking of the butt portion of an ingot with said bottom block while at the same time maintaining sliding contact with said ingot butt portion as the butt portion of the ingot shrinks and curls due to cooling and solidification, said drain holes are located closer to one end of said recess means said recess means including inclined surfaces that project upwardly and inwardly from their



associated drain holes as well as toward the central part of the bottom block, said recess means also being adapted to receive molten metal at the start of the casting operation and initial formation of the butt portion of the ingot, which molten metal upon solidification forms appendages that in part have configurations which match and mate with the inclined surfaces of the recess means whereby the appendages can maintain sliding contact with the recess means to thereby stably support the ingot on and minimize ingot movement relative to the bottom block during the casting operation.

4,509,581

MACHINE FOR CONTINUOUSLY CASTING BATTERY GRIDS

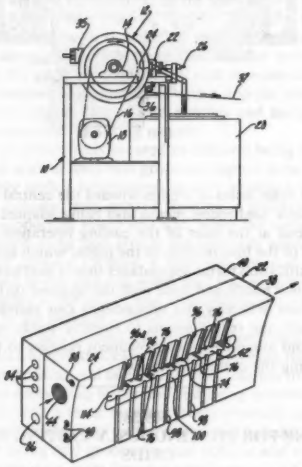
Jack E. McLane; Raymond L. Schenk; Robert R. Rader, and John W. Wirtz, all of Port Huron, Mich., assignors to Wirtz Manufacturing Company, Inc., Port Huron, Mich.

Division of Ser. No. 380,056, May 20, 1982, Pat. No. 4,415,016. This application Jul. 27, 1983, Ser. No. 517,668
Int. Cl.³ B22D *11/10*
U.S. Cl. 164—479 **14 Claims**

1. In a machine for continuously casting battery grids, the machine including a drum adapted to be rotated in one direction and having on its outer peripheral surface a cavity which defines the pattern of the battery grid, said grid pattern comprising two sets of intersecting grooves, said grooves defining pads therebetween which form the outer peripheral surface of the drum and which define the open spaces between the wires of the cast battery grid, said machine including a shoe having an arcuate surface in mating engagement with said pads around an arcuate segment of the drum, said shoe having an orifice slot therein which is axially co-extensive with said cavity and which is open at the portion of said arcuate surface that is intermediate the circumferentially opposite ends of the shoe, said shoe having an inlet and an outlet communicating with axially spaced portions of the orifice slot, said machine also including means for directing molten lead at superatmospheric pressure to said inlet in an amount in excess of that required to progressively fill the grid cavity as it rotates past the opening in the orifice slot so that the excess is discharged through said outlet, that improvement which comprises means in the orifice slot for reducing the tendency for the lead to partially solidify and bridge circumferentially across the upstream and downstream sides of the opening in the orifice slot, said means comprising obstructions spaced lengthwise along the orifice slot which cause the lead flowing from said inlet to said outlet to follow an irregular undulating path across the outer peripheral surface of the drum.

10. In a method for continuously casting battery grids, by

using a machine which includes a drum adapted to be rotated in one direction and having on its outer peripheral surface a cavity which defines the pattern of the battery grid, said grid pattern comprising two sets of intersecting grooves, said grooves defining pads therebetween which form the outer peripheral surface of the drum and which define the open spaces between the wires of the cast battery grid, said machine including a shoe having an arcuate surface in mating engagement with said pads around an arcuate segment of the drum, said shoe having an orifice slot therein which is axially coextensive with said cavity and which is open at a portion of said arcuate surface that is intermediate the circumferentially



opposite ends of the shoe, said shoe having an inlet and an outlet communicating with axially spaced portions of the orifice slot, said machine also including means for directing molten lead at superatmospheric pressure to said inlet in an amount in excess of that required to progressively fill the grid cavity as it rotates past the opening in the orifice slot so that the excess is discharged through said outlet, the method of preventing lead sludge from circumferentially bridging across the upstream and downstream edges of the opening of the orifice slot which comprises providing obstructions spaced lengthwise along the orifice slot for causing the molten lead to flow from said inlet to said outlet in an undulating path along said opening.

4,509,582

METHOD OF AND ARRANGEMENT FOR, RECOVERING THE SENSIBLE HEAT OF A CONTINUOUSLY CAST STRAND

Othmar Kriegner, St. Valentin, Austria, assignor to Voest-Alpine Aktiengesellschaft, Linz, Austria

Continuation of Ser. No. 248,979, Mar. 30, 1981, abandoned. This application Oct. 27, 1983, Ser. No. 546,066

Claims priority, application Austria, Apr. 15, 1980, 2024/80

Int. Cl.³ B22D *11/124*; F27D *15/02*

U.S. Cl. 164—486 **13 Claims**

1. A method of recovering the sensible heat of an undivided continuously cast strand guided through a cooling chamber comprising the steps of:

bringing a supply of coolant into direct contact with said strand immediately after said strand emerges from a mould into said cooling chamber and while said strand has at least a partial liquid core, thereby forming a coolant vapor,

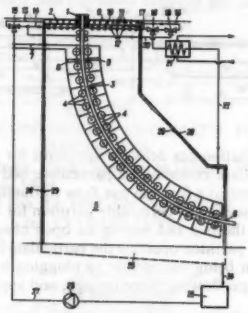
bringing the coolant vapor thus formed into heat exchange with a closed surface condenser arranged within said cooling chamber and through which a flow-through medium flows, and

bringing said flow-through medium of said closed surface condenser into further heat exchange with a heat transformer arranged outside said cooling chamber.

3. In an arrangement for recovering the sensible heat of a continuously cast strand, to be used in a continuous casting plant, in particular in a continuous casting plant for slabs, and of the type including

a closed cooling chamber including a secondary cooling zone therein;

spraying nozzles provided in said secondary cooling zone and directed toward said cast strand; and



a coolant being sprayed onto said cast strand through said spraying nozzles, the improvement wherein:

said closed cooling chamber is arranged immediately adjacent a mould so that said cast strand is guided through said cooling chamber immediately after its emergence from said mould and while said strand is undivided and has at least a partial liquid core,

said arrangement further comprising

at least one closed surface condenser provided within said closed cooling chamber,

a flow-through medium flowing through said closed surface condenser, and

at least one heat transformer arranged outside said cooling chamber and connected with said at least one closed surface condenser.

4,509,583

APPARATUS FOR REGENERATIVE FLUE GAS HEAT EXCHANGER

Günther Raths, Olpe, Fed. Rep. of Germany, assignor to Apparatebau Rothemühle Brandt & Kritzler Gesellschaft mit beschränkter Haftung, Rothemühle, Fed. Rep. of Germany

Filed Oct. 20, 1983, Ser. No. 543,958

Claims priority, application Fed. Rep. of Germany, Oct. 21, 1982, 3238941

Int. Cl.³ F28D *17/00*

U.S. Cl. 165—4 **6 Claims**

1. A regenerative heat exchanger for processing a crude flue gas from a boiler comprising:

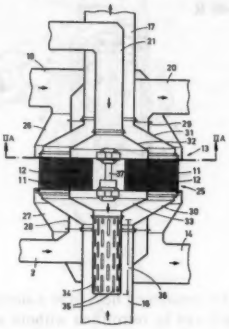
a stationary regenerated heat exchanger mass adapted to be traversed by a gas;

a fixed feed hood communicating with one side of said mass and a fixed collection hood communicating with an opposite side of said mass;

a rotary feed hood and a rotary collection hood on opposite sides of said mass within said fixed hood for communicating with registered limited portions of said mass;

means for introducing a first gas stream into one of said feed hoods and for conducting said first gas stream from the corresponding collection hood and means for introducing a second gas stream into the other of said feed hoods and for collecting said second gas stream into the other collection hoods whereby said first and second gas streams are passed in a regenerative indirect heat exchange relationship through said mass, said means including respective fixed ducts communicating with said hoods;

and respective fittings on opposite sides of said mass for passing a third gas stream through said heat exchanger.



4,509,584

HEAT-TRANSFERRING ELEMENTS FOR REGENERATIVE HEAT EXCHANGE IN GAS-GAS FLUIDIZED BED HEAT EXCHANGERS

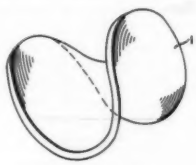
Stanislaw Michalak, Reichshof, and Bernd Hermanns, Gummersbach-Rebbelroth, both of Fed. Rep. of Germany, assignors to Apparatebau Rothemühle Brandt & Kritzler GmbH, Wenden, Fed. Rep. of Germany

Filed Sep. 22, 1982, Ser. No. 421,488

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1982, 3213972

Int. Cl.³ F28D *19/02*

U.S. Cl. 165—10 **4 Claims**



1. A heat-transferring element having increased surface areas as well as good thermal conducting for regenerative heat exchange in a gas-gas fluidized bed heat exchanger, said element having a greater specific surface than spheres as well as being embodied stable to withstand increased turbulence in the fluidized bed heat exchanger during heat transfer therewith as a separate and distinct, freely movable, saddle-shaped body having a self-cleaning effect and having a surface construction arcuate on opposite sides so that heat can be transferred better from both sides into the element having a thickness in a range of only 1 mm to 3 mm to reduce material content, whereby necessarily also pressure losses in the heat exchanger decrease while also having an excellent aerodynamic behavior and increased turbulence in the fluidized bed heat exchanger.

4,509,585

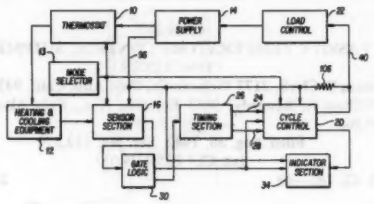
ENERGY MANAGEMENT CONTROL SYSTEM

George T. Carney, Boardman, Ohio, and Gary C. Heath, Hermitage, Pa., assignors to Energy Control Products, Inc., Youngstown, Ohio

Filed Jan. 9, 1984, Ser. No. 569,203

Int. Cl.³ F23N *5/20*; H02J *1/00*

U.S. Cl. 165—12 **39 Claims**



1. In combination with at least one device for controlling consumption of energy, a power supply, manual selector means for enabling the device, and condition monitoring means connected to the power supply for operation of the enabled device in response to energy demand, the improvement residing in the management of energy consumption, comprising sensing means responsive to said operation of the enabled device for detecting the energy demand, load control means connected to the power supply for interrupting said operation of the enabled devices by the power supply, programmed cycle control means connected to the load, control means for establishing a plurality of different time dependent interruption cycles causing the load control means to intermittently interrupt said operation of the enabled device initiated by energy demand, timing means connected to the cycle control means for changing the interruption cycles controlling said operation of the enabled device, and logic means operatively connecting the sensing means to the timing means for directionally controlling said change in the interruption cycles in accordance with the duration and absence of the energy demand.

4,509,586

TEMPERATURE CONTROL DEVICE FOR A REFRIGERATING APPARATUS HAVING BOTH A HEATING MEANS AND A COOLING MEANS

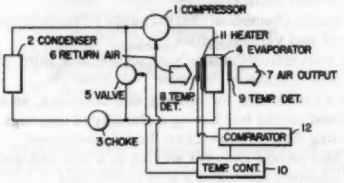
Shin Watabe, Nagoya, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,171

Claims priority, application Japan, May 20, 1982, 57-84006

Int. Cl.³ F25B *29/00, 41/00*; G05D *23/00*

U.S. Cl. 165—29 **4 Claims**



1. A temperature control device for a refrigerating apparatus having both a heating means and a cooling means, said device comprising a means for detecting a temperature of return air from an interior of a storage area of said refrigerating apparatus, a means for detecting a temperature of air which is blown

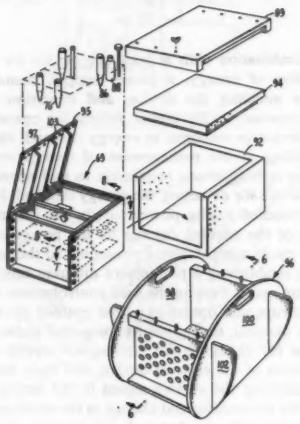
into said interior of said storage area, and a means for controlling said heating and cooling means in accordance with the temperature detected by said means for detecting said return air temperature when a set temperature is lower than a predetermined temperature and in accordance with the lower one of the two temperatures detected by said two temperatures detecting means when said set temperature is higher than said predetermined temperature.

4,509,587

PASSIVE TEMPERATURE CONTROL SHIPMENT CONTAINER

Thomas S. Clark, 2177 Webster St., Palo Alto, Calif. 94301, and William S. Kennedy, 3043 Emerson Ave., Palo Alto, Calif. 94306

Filed Aug. 30, 1982, Ser. No. 412,579
Int. Cl.³ F25B *29/00*
U.S. Cl. 165—61 **2 Claims**



1. A passive temperature control device comprising in combination:

a. a container,

b. a first chamber for holding a sample in said container,

c. said first chamber having at least two spaced heat conductive vertically opposed baffles forming at least a part of the walls of said first chamber,

d. a plurality of heat conductive horizontal baffles within said first chamber connecting said vertical baffles and forming a plurality of horizontal sealed compartments within said first chamber,

e. a second chamber in heat exchange relationship with one of said vertical baffles,

f. a third chamber in heat exchange relationship with another of said vertical baffles,

g. convective fluids in said second and third chambers of said container,

h. a carrier box for holding said container, an end wall of said carrier box having a plurality of openings for permitting flow of convective fluid therethrough,

i. said second chamber serving as a heat sink and said third chamber serving as a heat source, and

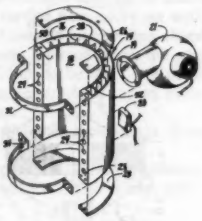
j. means for preventing the inhibiting of fluid circulation through the openings of the carrier box end wall and the third chamber of said container comprising a first set of outwardly extending fins and a second set of outwardly extending fins at right angles thereto which space said carrier box from surrounding objects during shipment and the like.

4,509,588

HEAT RECLAIMER

Fred Parham, Corydon, Iowa, assignor to Deflecta-Shield Corporation, Corydon, Iowa

Filed May 20, 1982, Ser. No. 380,093
Int. Cl.³ F24B *7/02*
U.S. Cl. 165—80 R **10 Claims**



1. A device for reclaiming heat from a stove or furnace flue or the like which can be retrofitted without any modification to the flue comprising:

a concavely shaped housing defining an enclosed air chamber having a concave interior wall made of highly thermal conductive material, a concentric outer wall spaced apart from the inner wall, top and bottom end walls, and edge walls, said interior and outer walls extending approximately halfway circumferentially around said flue;

heat transfer members projecting from the inward facing surface of said interior wall of said housing being integrally formed with said interior wall and extending throughout said air chamber so as to substantially fill up the space between said interior and said outer wall, said heat transfer members being thinnest at their very outwardmost edges;

an air inlet means in said outer concentric wall of said housing for inlet of pressurized unheated air from a pressurized air source;

an air outlet means positioned along each said edge wall for the outlet of heated air from said air chamber; and

attachment means for movably attaching said housing to said flue in such a manner that said interior surface is in conforming thermal conductive contact at a maximum number of points approximately halfway circumferentially around said flue.

4,509,589

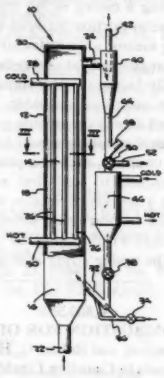
CIRCULATING BED HEAT EXCHANGER FOR COOLING SHALE ASH

Franklin B. Carlson, Broomfield, and Robert N. Hall, Boulder, both of Colo., assignors to Tosco Corporation, Santa Monica, Calif.

Filed Aug. 5, 1982, Ser. No. 405,529
Int. Cl.³ F28G *13/00*
U.S. Cl. 165—95 **15 Claims**

1. In a process for removing heat from a hot gas stream containing entrained hot fine particles by passing said gas stream into contact with a heat exchange surface defining a heat exchange zone, wherein the improvement comprises increasing the rate of heat transfer between said gas stream and

said heat exchange surface by introducing sufficient gas stream entrainable heat transfer solids into said gas stream to cause the



density of solids in said heat exchange zone to be between 1 lb/ft^3 and 10 lb/ft^3.

4,509,590

HEAT TRANSFER DEVICE AND METHOD OF MANUFACTURE

Harvey E. Svetlik, Dallas, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 22, 1982, Ser. No. 341,719
Int. Cl.³ F28D *15/00*
U.S. Cl. 165—104.27 **18 Claims**

1. A heat transfer device comprising:

(a) a gas impervious, elongated container sealed against the ingress or egress of vapors or gases;

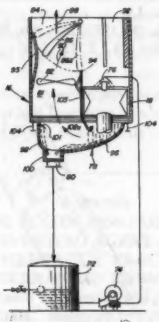
(b) a major portion of a heat transfer medium which evaporates and condenses within the temperature range at which said device is to be utilized, partially filling said container at the highest temperature to which the device is to be subjected, thereby forming a void space therein; and a minor amount of a solidifiable or liquifiable normally gaseous pressurization medium adapted to undergo phase transition and which is gaseous at a temperature at least as high as about the lowest temperature to which said device is subjected, in an amount sufficient to create a positive pressure in said void space at said at least said lowest temperature to which said device is to be subjected.

4,509,591

VACUUM PRODUCING CONDENSER

Walter Kals, Hastings-on-Hudson, N.Y., assignor to Niagara Blower Company, Buffalo, N.Y.

Continuation-in-part of Ser. No. 324,785, Nov. 25, 1981, abandoned. This application May 4, 1983, Ser. No. 491,594
Int. Cl.³ F28F *13/12*
U.S. Cl. 165—122 **9 Claims**



1. In a vacuum producing condenser for vapors containing non-condensible gases, a shell having a generally horizontal condenser chamber, a bundle of condenser tubes generally horizontally across said condenser chamber, means for directing water downwardly onto said bundle of condenser tubes, means for discharging air from the interior of said shell to create a downward flow of air through said condenser chamber across said bundle of condenser tubes, a basin at the bottom of said condenser chamber for collecting and draining said water directed onto said bundle of condenser tubes, said basin being configured to guide said downward flow of air smoothly through a 180° turn and back upwardly into said shell for exhaustion therefrom, and means in the upper portion of said basin for directing air from said condenser chamber toward the lower portion of the basin to provide a more uniform air flow velocity through a greater portion of the basin.

4,509,592

PLATE TYPE EVAPORATOR

Ken'ichi Yamada; Hiroyuki Sumitomo; Akira Horiguchi, and Kenzo Masutani, all of Osaka, Japan, assignors to Hisaka Works, Ltd., Osaka, Japan

Filed Aug. 3, 1979, Ser. No. 63,403
Claims priority, application Japan, Jan. 18, 1979, 54-5158
Int. Cl.³ F28F *3/04*
U.S. Cl. 165—166 **1 Claim**

1. A plate type evaporator comprising a plurality of vertically extending plate elements assembled face-to-face to define therebetween alternate channels for a heating medium and for a liquid to be evaporated, each plate element being formed on its heat transfer surface with a plurality of vertically extending transversely spaced ridges projecting toward the associated liquid channel, said ridges abutting against the flat surface portions between ridges of an adjacent plate element, such places of contact serving to facilitate the evolution of bubbles, each of said liquid channels being divided by said ridges into a

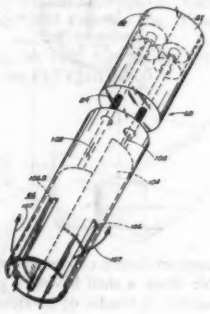
plurality of vertically extending sections laterally separated from each other to facilitate evaporation.

4,509,593

DOWNHOLE MOBILITY AND PROPULSION APPARATUS

Jack L. Traver; C. Dale Palmer, both of Lafayette, and Richard Hughes, Youngsville, all of La., assignors to Traver Tool Company, Lafayette, La.

Filed Jun. 20, 1983, Ser. No. 505,583
Int. Cl.³ E21B *7/08*
U.S. Cl. 166—63 **11 Claims**



1. An apparatus for steering equipment downhole, comprising:

a. a tool body;

b. steering means, including gate means on said tool body moveable between upward and downward positions for allowing fluid flow through a portion of said tool body;

c. impeller means rotatably mounted within said tool body for directing said fluid flow through said gate means on said tool body;

d. first means for imparting rotation to said impeller means; and

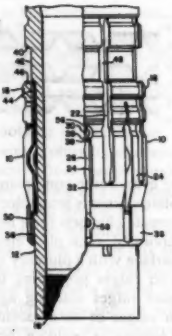
e. second means for moving said gate means between said upward and downward positions.

4,509,594

MUDLINE CASING HANGER ASSEMBLY

Lionel J. Milberger, and Charles D. Bridges, both of Houston, Tex., assignors to Vetco Offshore, Inc., Ventura, Calif.

Filed Nov. 29, 1982, Ser. No. 445,316
Int. Cl.³ E21B *23/00*
U.S. Cl. 166—208 **11 Claims**



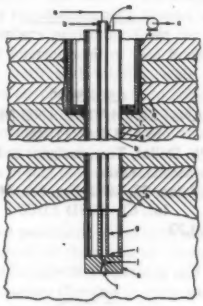
1. A casing hanger assembly for supporting a casing string within and from a tubular member comprising: a cylindrical hanger body having a downwardly-facing load shoulder at an upper elevation, first attaching means at a lower elevation, means for supporting a casing string from said hanger body, and a reduced diameter portion between said load shoulder and said first attaching means; a diametrically compressible collet surrounding said hanger body at said reduced diameter portion having, an upwardly-facing support shoulder at the upper end adapted to support said load shoulder, outwardly-extending latch means adapted to engage mating grooves in the tubular member, and a second attaching means located on the collet; a plurality of tensile coupons, each comprising a vertically elongated member attached to said first and second attaching means, and having a weakened section between the attached ends, said weakened section being strong enough to pull the collet into and through a riser casing but weak enough to break when the load of the casing string is imposed.

4,509,595

IN SITU COMBUSTION FOR OIL RECOVERY

Guy Savard, Westmount, and Robert G. H. Lee, Montreal, both of Canada, assignors to Canadian Liquid Air Ltd/Air Liquide, Montreal, Canada

Filed Jan. 22, 1982, Ser. No. 341,677
Claims priority, application Canada, Jan. 28, 1981, 369497
Int. Cl.³ E21B *43/243, 36/00*
U.S. Cl. 166—261 **13 Claims**



4. An oil recovery installation, comprising,

an inner conduit for an oxidant gas and a surrounding outer conduit forming therebetween a water jacket for cooling liquid leading from an upper end at the surface through a sealing well casing to a lower end within the underground oil recovery formation,

terminal means closing the lower end of the outer conduit and providing a restricted passage in communication with the inner conduit for injecting oxygen into the formation,

means for supplying oxidant gas under pressure to the upper end of the inner conduit,

means for supplying water to circulate within the cooling jacket, and

means for controlling the supply rate of oxidant gas and means for controlling the water supply rate,

the inner conduit being connected to the injection passage and there being a communication between the jacket and the injection passage so that both water and oxidizing gas may be injected.

6. A method of recovering oil from an underground formation by combustion of oil in situ in which an active fluid comprising combustion supporting oxidant gas containing more than 30% oxygen by volume and water are flowed into the formation to control the flame temperature, to produce steam drive, and to recover heat behind the flame front, comprising supplying the oxidant gas through a passage formed by an

inner conduit leading from a supply end at the surface to an injection end in the oil-containing formation,

surrounding the inner conduit with water flowed through an outer passage surrounding the inner conduit from the surface of the formation,

supplying water as an active fluid to the injection end of the inner passage,

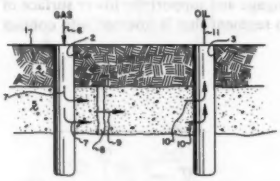
passing the active fluid from the bottom of the inner passage through a single restricted injection passage aligned with the end of the inner passage and provided with a venturi throat into the formation at a velocity greater than the maximum possible flame velocity in the formation.

4,509,596

ENHANCED OIL RECOVERY

Leonard W. Emery, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Jan. 23, 1984, Ser. No. 573,093
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—263 **4 Claims**



1. In an enhanced oil recovery method which employs a pressurized gas injection process through at least one injection well for the miscible displacement of oil from a subterranean geologic formation, wherein said gas has a pressure in said formation above which said gas becomes miscible with said oil, and said formation has a pressure point above which it fractures, said fracture pressure being above said miscibility pressure, the improvement comprising (1) injecting said gas at a volumetric rate and in a quantity such the pressure in said formation increases above said miscibility pressure and continuing the injection of said gas to increase said formation pressure until it approaches but does not exceed said fracture pressure, (2) terminating gas injection before said formation pressure reaches said fracture pressure and shutting in said at least one injection well thereby holding said injected gas in said formation to allow it to expand outwardly into said formation on its own thereby lowering said formation pressure, and (3) injecting additional gas into said formation when the gas in said formation has expanded pursuant to step (2) above to the extent that said formation pressure approaches but does not go below said miscibility pressure whereby oil production is possible during one or more of steps (1), (2) and (3).

4,509,597

SODA-ANTHRAQUINONE LIGNIN SACRIFICIAL AGENTS IN OIL RECOVERY

Richard E. Dardis, Brevard, N.C., assignor to Olin Corporation, Pisgah Forest, N.C.

Filed May 3, 1984, Ser. No. 606,636
Int. Cl.³ E21B *43/22*
U.S. Cl. 166—274 **4 Claims**

1. In a method for recovering oil from a subterranean formation containing oil and having at least one injection well and at least one production well wherein a micellar dispersion containing a surfactant is injected via said at least one injection well into said subterranean formation in order to displace the oil contained therein to said at least one production well wherein it is produced, the improvement comprising:

prior to injecting said micellar dispersion, injecting into said subterranean formation via said at least one injection well a fluid containing soda-anthraquinone lignin which is adsorbed by adsorptive sites within said subterranean formation and functions as a sacrificial agent for the surfactant and other components contained in said micellar dispersion.

2. In a method for recovering oil from a subterranean formation containing oil and having at least one injection well and at least one production well wherein a micellar dispersion containing a surfactant is injected via said at least one injection well into said subterranean formation in order to displace the oil contained therein to said at least one production well wherein it is produced, the improvement comprising:

injecting into said subterranean formation in admixture with said micellar dispersion a soda-anthraquinone lignin which is adsorbed by adsorptive sites within said subterranean formation and functions as a sacrificial agent for the surfactant and other components of said micellar dispersion.

4,509,598

FRACTURING FLUIDS CONTAINING BOUYANT INORGANIC DIVERTING AGENT AND METHOD OF USE IN HYDRAULIC FRACTURING OF SUBTERRANEAN FORMATIONS

Robert B. Earl; David B. Larson, and Huy X. Nguyen, all of Tulsa County, Okla., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 25, 1983, Ser. No. 478,933
Int. Cl.³ E21B *43/26*
U.S. Cl. 166—308 **13 Claims**

1. In the method of hydraulically fracturing a subterranean formation penetrated by a wellbore by injecting a fracturing fluid through the wellbore and against the formation at a rate and pressure at least sufficient to initiate and/or extend a fracture into the formation, the improvement comprising: (1) initiating the fracture with a first fluid which is a pad fluid; and (2) extending the fracture with a second fluid comprising a carrier fluid and a bouyant inorganic diverting agent in an amount sufficient to inhibit or prevent the growth of an upward vertical fracture; said second fluid being injected through the wellbore and into the formation at a rate and pressure high enough to extend the fracture and to carry the diverting agent into the fracture but low enough to permit the diverting agent to accumulate in the upper portion of the fracture and form a compacted barrier zone which is capable of diverting subsequently injected fluids downwardly and/or horizontally.

4,509,599

GAS WELL LIQUID REMOVAL SYSTEM AND PROCESS

David V. Chenoweth, Lahaina, Hi., and David M. McStravick, Houston, Tex., assignors to Baker Oil Tools, Inc., Orange, Calif.

Filed Oct. 1, 1982, Ser. No. 432,166
Int. Cl.³ E21B *36/00, 43/25, 43/34*
U.S. Cl. 166—370 **18 Claims**

1. A split-stream assembly for transporting gas at a prescribed flow rate to a surface gathering system from a subterranean producing formation yielding gases and liquids and having, in the presence of accumulating liquids at the producing formation, a bottom hole pressure insufficient to independently transport gas from the producing formation to the surface, comprising:

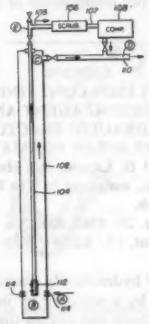
means for defining separate first and second fluid transmission conduits in said well, extending from the surface of the well to the producing formation, each fluid transmission conduit communicating with the producing formation;

compression means for lowering the pressure in the first fluid transmission conduit at the surface, said compression means communicating with the surface gathering system at a horsepower sufficient to transport a two-phase gas-liquid medium from the formation through the first fluid

transmission conduit to the gathering system at a flow rate less than the prescribed flow rate; and

an interconnection at the surface of the well establishing gathering system communication with the second fluid transmission conduit whereby a two-phase gas-liquid medium is produced through the first fluid transmission conduit and gas alone is produced through the second fluid transmission conduit, the sum of the flow rates in the first and second fluid transmission conduits being equal to the prescribed flow rate.

16. A method of transporting gas at a prescribed flow rate to a surface gathering system from a subterranean producing formation yielding gases and liquids and having, in the presence of accumulating liquids at the producing formation, a bottom hole pressure insufficient to independently transport



gas from the producing formation to a gathering line having a prescribed pressure, the method comprising the steps of: inserting a tubing string between the surface and the producing formation within a primary fluid transmission conduit in the well, the primary fluid transmission conduit communicating directly with the gathering line; and installing a compressor at the surface, having a theoretical adiabatic horsepower less than the theoretical adiabatic horsepower necessary to transport fluids at the prescribed flow rate to the gathering line at the prescribed pressure in the gathering line, the input pressure of the compressor being sufficient to permit two-phase liquid-gas transport through the tubing string at a flow rate less than said prescribed flow rate, and producing gas through the primary fluid transmission conduit; the sum of the flow rate in the tubing string and the primary fluid transmission conduit being equal to the prescribed flow rate.

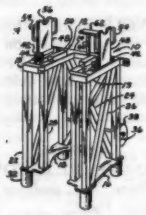
4,509,600

PIPE BASE WELL SCREEN AND SYSTEM FOR JOINING A PLURALITY OF WELL SCREEN SEGMENTS

Harry J. Boudreaux, Lafayette, La.; David C. Card, New Brighton, and Bernard M. Hanson, Excelsior, both of Minn., assignors to UOP Inc., Des Plaines, Ill.

Filed Jul. 26, 1982, Ser. No. 401,500
Int. Cl.³ E21B *19/16*
U.S. Cl. 166—381 **6 Claims**

2. A slip assembly for use in a system for joining successive lengths or segments of pipe base well screen which have a screen jacket portion mounted on a pipe base member at a predetermined distance from a coupling at the upper end of the pipe base member and a boss ring integrally mounted to the pipe base member intermediate the screen jacket and coupling, said slip assembly comprising upper and lower support surfaces which have central apertures therethrough for accommodating vertically positioned well screen segments, said upper and lower support surfaces having overlying portions of said apertures extending to an open side edge thereof; means for vertically spacing said upper and lower support surfaces; means for locking said slip assembly against rotation relative to a horizontal surface upon which its lower support surface is resting; and a plurality of support plates mounted on said upper support surface for movement relative thereto, said support plates being selectively movable from an inoperative position into an operative position, adjacent to each other and immedi-



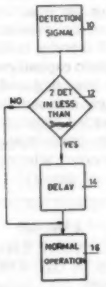
ately surrounding the periphery of the pipe base portion of a well screen which is above a screen jacket portion, wherein they will engage and support the lower surface of the boss ring on a screen segment that is lowered into contact with them.

4,509,601

DISCRIMINATION CIRCUITRY FOR FIRE AND EXPLOSION SUPPRESSION APPARATUS

Yehiel Spector, Tel Aviv, and Ilan Cohen, Petach Tikva, both of Israel, assignors to Spectronix Ltd., Tel Aviv, Israel

Filed Mar. 30, 1983, Ser. No. 481,054
Claims priority, application Israel, Apr. 18, 1982, 65517
Int. Cl.³ A62C *37/18*; G08B *17/00*
U.S. Cl. 169—61 **5 Claims**



1. Discrimination apparatus for use in a fire and/or explosion detection and suppression system including a plurality of detectors and suppression apparatus operated by the detectors, the discrimination apparatus comprising:

means for sensing detection by a first plurality of detectors within a predetermined time period and providing an output signal only when said first plurality of detectors detect within said predetermined time period; and

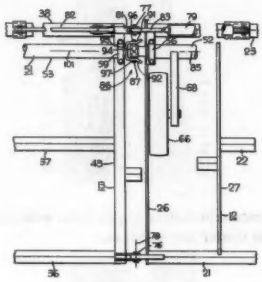
means responsive to an output signal provided by said sensing means indicating detection by said first plurality of detectors within said predetermined time period for inhibiting operation of the suppression apparatus.

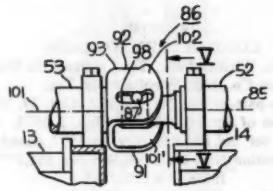
4,509,602

AGRICULTURAL IMPLEMENT WITH HINGE CONNECTION FOR FOLDING CROSS SHAFT

David E. Russ, Roscoe, Ill., assignor to Allis-Chalmers Corp., Milwaukee, Wis.

Filed May 25, 1983, Ser. No. 498,141
Int. Cl.³ A01B 73/00
U.S. Cl. 172—311 4 Claims





1. In an agricultural implement having a main frame adapted to be connected in towed relation to a draft vehicle for forward movement through a field, a wing frame pivotally connected to one lateral side of the main frame for swinging movement about a horizontal longitudinal pivot axis between a generally horizontal working position in which it is generally coplanar with the main frame to a folded upright transport position and a transverse cross shaft with radially extending arms rotatably carrying support wheels and having main frame and wing frame segments which are substantially coaxial in the working position of said wing frame, a hinge connection joining adjacent ends of said cross shaft segments at said longitudinal pivot axis characterized by

a pin having a central portion rigidly secured to said adjacent end of said main frame segment of said cross shaft with its axis at substantially right angles to said axis of said main frame segment and having opposite cylindrical end portions,

a pair of legs having corresponding ends rigidly secured to the adjacent end of said wing frame segment of said cross shaft and extending therefrom toward said main frame segment and terminating in free ends,

wall means in said legs defining a pair of slots elongated in the direction toward said main frame segment, said slots lying on opposite sides of and being radially open relative to said axis of said wing frame segment, each of said slots presenting parallel confronting bearing surfaces,

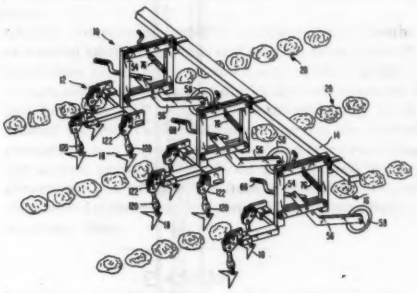
said pin end portions being disposed, respectively, in said slots and being in cooperative bearing engagement with said bearing surfaces thereof when said wing frame is in its working and transport positions and during movement of said wing frame between said positions.

4,509,603

ADJUSTABLE CULTIVATOR TOOL HOLDER

Louis E. Adams, U.S. Rte. 1, Box 59E, Leary, Ga. 31762

Filed Aug. 9, 1983, Ser. No. 521,776
Int. Cl.³ A01B 65/02
U.S. Cl. 172—427 3 Claims



1. An adjustable cultivator tool holder for use with a tool bar adapted to be secured to a vehicle for effecting movement of such tool bar and said adjustable tool holder to cultivate soil between spaced rows of crops, said adjustable cultivator tool holder comprising:

a cultivator tool support means including a vertical bar, means for attachment of said vertical bar to a tool bar, a vertical mounting bar positioned rearwardly of said vertical bar and generally parallel thereto, and spaced upper and lower link arms pivotably attached at forward ends to upper and lower portions respectively of said vertical bar and pivotably attached at rearward ends to upper and lower portions respectively of said vertical mounting bar, said vertical bar, upper and lower link arms, and vertical mounting bar defining a generally rectangular vertical plane;

a gauge wheel secured to a lower end of a support leg, said support leg being pivotably secured at a point intermediate its ends to said lower link arms and being adjustably positioned by a gauge wheel height adjusting crank assembly;

at least first and second cultivator tool holder frame arms fixedly secured at first ends to each other and to said vertical mounting bar, each of said tool holder frame arms extending outwardly from said vertical mounting bar in a generally horizontal plane which is generally perpendicular to said vertical mounting bar, each of said tool holder frame arms being generally rectangular in cross-section and having plural spaced holes;

a tool mounting sleeve slideably carried on each of said frame arms, each of said sleeves being generally rectangular in cross-section and having spaced holes, said holes in said sleeve and in said cooperating frame arm along which each of said sleeves is slideable being alignable and adapted to receive quick release pins to secure said sleeve in a selected position on said frame arm;

a tool supporting flange secured to each of said tool mounting sleeves, each of said tool supporting flanges being generally perpendicular to said horizontal plane defined by said cultivator tool holder frame arms and generally parallel to said vertical plane defined by said cultivator tool support means; and

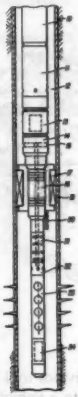
means for attaching a cultivator tool to each of said tool supporting flanges.

4,509,604

PRESSURE RESPONSIVE PERFORATING AND TESTING SYSTEM

James M. Upchurch, Stafford, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Apr. 16, 1982, Ser. No. 369,209
Int. Cl.³ E21B 43/11
U.S. Cl. 175—4.52 9 Claims



5. A method for perforating a well bore interval isolated in a well by packer means, comprising the steps of:

locating a perforating gun in the isolated interval;

establishing fluid communication between the isolated interval and the well surface by means of a pipe string, the space between the pipe string and the walls of the well bore above the packer means defining an annulus;

independently of the step of establishing fluid communication between the isolated interval and the well surface, applying relative pressure at the surface of the well to develop a predetermined difference between the pressure of fluid in the isolated interval and the pressure of fluid in the annulus; and

firing the gun in response to the predetermined pressure difference.

4,509,605

WIRELINE PROTECTOR WITH IMPROVED CLAMPING MECHANISM

Homan C. Tullos, Lafayette, La., and Dewey W. Woods, Livingston, Tex., assignors to Kelly Bushing Tools, Inc., Lafayette, La.

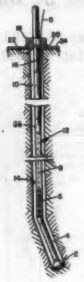
Continuation-in-part of Ser. No. 246,095, Mar. 20, 1981, Pat. No. 4,431,067. This application Jul. 8, 1983, Ser. No. 511,984
Int. Cl.³ E27B 47/00
U.S. Cl. 175—57 27 Claims

1. A wireline protector for protecting an electrical wireline used in a downhole drilling operation where such wireline passes through the opening in a drilling rotary table through which the drill string passes, said wireline protector comprising:

an elongated section capable of extending through the opening in the rotary table without interfering with the drill string, said elongated section having an elongated opening into which the portion of the wireline passing through the rotary table can be inserted so as to be substantially protected by said elongated section;

a support base connected to said elongated section and capable of being arranged in engagement with the rotary table for maintaining said wireline protector in a fixed position; and

clamping means mounted on said support base for enabling clamping of the wireline to prevent its movement, said



clamping means including toggle links which are movable beyond the center line position.

4,509,606

AXIAL RETURN HAMMER

Clyde A. Willis, Wichita Falls, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Continuation-in-part of Ser. No. 201,772, Oct. 29, 1980, which is a continuation of Ser. No. 958,886, Jan. 3, 1978, which is a continuation of Ser. No. 854,810, Nov. 25, 1977, abandoned. This application Nov. 16, 1983, Ser. No. 552,277
Int. Cl.³ E21B 7/18
U.S. Cl. 175—69 7 Claims

1. A method for drilling a borehole comprising the following steps:

providing a concentric dual tube pipe string which defines a central passageway and an annular passageway;

providing an air driven hammer drill at a lower end of the pipe string, said hammer drill comprising:

a hammer bit which defines a bit face;

means for receiving pressurized air from the annular passageway;

hammer means operated by the pressurized air for delivering successive impacts to the bit;

conducting means for directing exhaust air from the hammer means to the periphery of the bit face; and

channeling means for passing substantially all of the exhaust air and entrained cuttings from the periphery of the bit face, across the bit face and through at least one passage extending between a central portion of the bit face and the central passageway;

said hammer drill defining a wide bodied portion which substantially fills the borehole formed by the bit;

providing an air injection sub in the pipe string near the hammer drill to inject compressed air from the annular passageway into the central passageway;

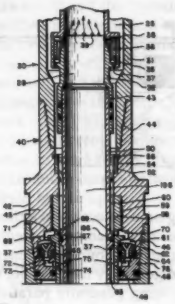
operating the hammer drill to form a borehole; and

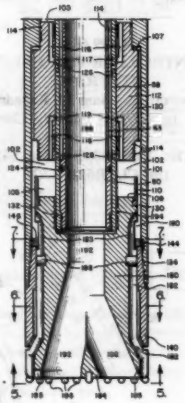
maintaining a head of water in the borehole annulus above the hammer drill during operation of the hammer drill to cause water to cascade down continuously around the hammer drill to the region of the bit face and to sweep across the bit face into the passage and on into the central passageway;

said wide bodied portion of the hammer drill operating to restrict, direct and accelerate the flow of water to the region of the bit face;

said flow of water cooperating with the flow of exhaust air

to prevent the movement of cuttings and exhaust air into the borehole annulus;





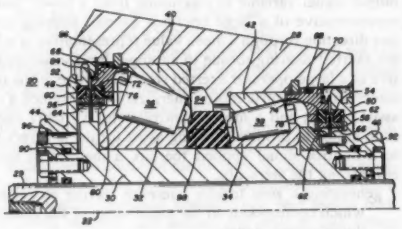
said air injection sub operating to lift water and cuttings up the central passageway.

4,509,607

COMPRESSIBLE PRESSURE COMPENSATOR WITHIN CLOSED LUBRICANT VOLUME OF AN EARTH BORING APPARATUS

William C. Saxman, Irving, and Larry J. Parker, Fort Worth, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 26, 1983, Ser. No. 527,704
Int. Cl.[3] E21B *10/24*
U.S. Cl. 175—227 **4 Claims**



1. An improved earth boring apparatus having an earth contacting member rotatably mounted on bearing means disposed on an axle member, and seal means disposed between said earth contacting member and said axle member, said seal means including a pair of primary seals, one each adjacent but outside said bearing means, to define therebetween a sealed lubricant volume enclosing said bearing means, and a lubricant having a level substantially filling said lubricant volume, said primary seals generally effective to prevent loss of said lubricant until the internal pressure exceeds the external pressure on said primary seals by a certain limit, wherein said improvement comprises:

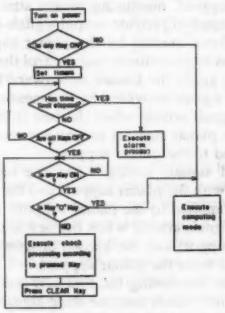
a resilient compressible member disposed entirely within said sealed lubricant volume, said member being generally impervious to said lubricant and compressible in response to increased internal pressure due to thermal expansion of said lubricant, said compression accommodating an increased volume of said lubricant to prevent the internal pressure in said sealed lubricant volume from exceeding the internal pressure limit of said primary seals thereby preventing loss of lubricant from said sealed lubricant volume and maintaining the lubricant level substantially as originally filled.

4,509,608

METHOD OF SELECTING ELECTRONIC SCALE OPERATING MODE, AND ELECTRONIC SCALE USING SAID METHOD

Michiyasu Hikita, Kusatsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Feb. 22, 1983, Ser. No. 468,706
Claims priority, application Japan, Feb. 22, 1982, 57-26957
Int. Cl.[3] G01G *9/00, 19/413*
U.S. Cl. 177—1 **10 Claims**



1. A method of selecting the operating mode of an electronic scale wherein either a computing mode or a checking mode is selected and operation is executed based on the selected mode, the computing mode being a mode wherein a control circuit performs an arithmetic operation based on a weight of articles sensed by a weight sensor and on items of data input from an input device having a plurality of keys, and causes a display device to display information relating to the articles, which information is inclusive of the result of the arithmetic operation, and the checking mode being a mode wherein said control circuit checks the operation of the electronic scale, said method comprising the steps of:

(a) sensing the state of each said key of the input device at the time that power is introduced to the electronic scale;

(b) executing operation in said computing mode when it is sensed in step (a) that no key of the input device is in the ON state;

(c) executing operation in said checking mode when it is sensed in step (a) that any of said keys of the input device is in the ON state, said operating in said checking mode comprising selectively operating a plurality of individual

checking modes according to any respective ones of said keys of the input device being in the ON state; and

(d) producing an alarm when each said key in the ON state does not assume the OFF state within a predetermined period of time.

4,509,609

WEIGHBELT APPARATUS

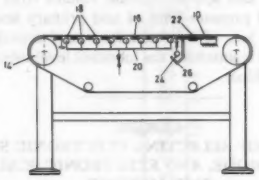
Willem J. Meiring, Stellenbosch, South Africa, assignor to Tobacco Research & Development Institute Limited, Zug, Switzerland

Filed Jul. 27, 1983, Ser. No. 517,822

Claims priority, application South Africa, Sep. 23, 1982, 82/6993

Int. Cl.³ G01G *9/00, 23/01, 23/14*

U.S. Cl. 177—1 **14 Claims**



1. A weighbelt apparatus having a belt upon which material is moved across the apparatus, a generally planar support for the belt extending across the apparatus, belt lifting means connected to the apparatus arranged to lift the belt out of contact with the planar support during operation of the apparatus, means arranged to apply a known downward force to the planar support, measuring means attached to the planar support arranged to provide output signals corresponding to a downward force exerted by the planar support at any time, control means to co-ordinate and control the belt lifting means, the means to apply the known downward force and to select three sets of signals provided by the measuring means:

(a) first signals arising when the belt is lifted out of contact with the planar support and no external downward force is applied to the planar support;

(b) second signals arising when the belt is lifted out of contact with the planar support and the known downward force is applied to the planar support; and

(c) third signals arising when the belt is in contact with the planar support and the known downward force has been removed from the planar support,

and means for processing the first and second signals to provide calibration values and the third signals with the calibration values to provide a measure of the mass carried by the belt.

4,509,610

WEIGHING DEVICE OF LOAD CELL TYPE

Junichi Hayashi, Akashi, Japan, assignor to Yamato Scale Company, Limited, Akashi, Japan

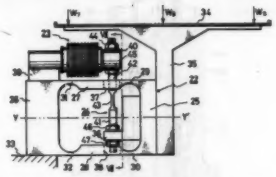
Filed Oct. 19, 1982, Ser. No. 435,113

Claims priority, application Japan, Oct. 28, 1981, 56-173411

Int. Cl.³ G01G *3/14, 3/08;* **G01L** *5/12*

U.S. Cl. 177—211 **4 Claims**

1. A weighing device, comprising a parallelogrammatic mechanism having first and second vertical members and first and second horizontal members coupled to form a parallelogram, each of said horizontal members having a pair of elastically deformable portions adjacent its ends, the first vertical member being fixed to a stationary part of said device, the second vertical member carrying a weighing cradle or platform of said device, a cantilever type load cell having one end fixed with respect to said stationary part and another end left free, a connecting rod coupled at one end thereof to said free end of said load cell and at the other end thereof to the second vertical member of the said parallelogrammatic mechanism which carries the weighing cradle; characterized in that said connecting rod is detachably coupled at one end in rigidly fixed fashion to said free end of the load cell and detachably coupled at its other end in rigidly fixed fashion to the second vertical member of the parallelogrammatic mechanism, said



connecting rod having no connection to either of said horizontal members of the parallelogrammatic mechanism, said connecting rod including at least one first generally flat portion and at least one second generally flat portion, the flat surface of said first flat portion being generally parallel to the plane of said parallelogram, and the flat surface of said second flat portion being generally perpendicular to said plane.

4,509,611

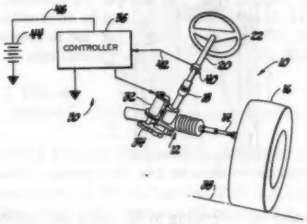
ADAPTIVE CONTROLLER FOR ELECTRIC POWER STEERING

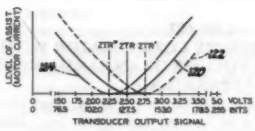
Alexander Kade, Detroit, and Sam M. Karadsheh, Troy, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Oct. 13, 1983, Ser. No. 541,781

Int. Cl.³ B62D *5/04*

U.S. Cl. 180—79.1 **9 Claims**




LEVEL OF ASSIST (MOTOR CURRENT)
ZTR" ZTR ZTR'
0 150 175 200 225 250 275 300 325 350 375 VOLTS
0 765 1020 1275 1530 1785 255 BITS
TRANSDUCER OUTPUT SIGNAL

1. In a motor vehicle electric power steering system including a torque transducer responsive to steering torque exerted by the operator of the vehicle for generating an electrical output signal variable in magnitude from a lower limit value representative of a large operator exerted steering torque in one direction through a mean value representative of no operator exerted steering torque to an upper limit value representative of a large operator exerted steering torque in the opposite direction, an electric motor energizable to produce a steering assist torque, and a motor controller for variably energizing such motor to produce steering assist torque in direct relation to a control signal applied thereto, a method of operation, comprising the steps of:

generating a zero torque reference having an initial value which corresponds to the mean value of the torque transducer output signal;

developing a control signal for said motor controller according to the magnitude of the difference between the zero torque reference and the transducer output signal, such difference being attributable to operator exerted steering

torque, to sources of error which affect the magnitude of the transducer output signal, or to both; and

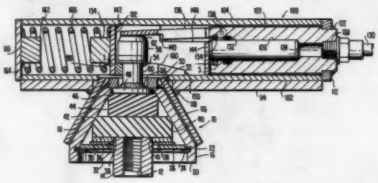
shifting the zero torque reference in a direction to reduce the difference between it and the transducer output signal in accordance with a predetermined time response characteristic so that over a period of time shifting of the zero torque reference due to operator exerted steering torque tends to cancel out and the remaining net shift tends to adaptively compensate the zero torque reference for sources of error which affect the magnitude of the transducer output signal thereby to cause the value of the zero torque reference to more nearly correspond to the actual value of the transducer output signal for which no steering torque is exerted by the operator of the vehicle.

4,509,612

LATCH MECHANISM FOR A TILT-CAB TRUCK

Thomas G. Stuart, Mukwonago, Wis., assignor to Applied Power Inc., Milwaukee, Wis.

Filed Sep. 28, 1982, Ser. No. 425,894
Int. Cl.³ B62D *33/06*
U.S. Cl. 180—89.14 **4 Claims**



1. A latch mechanism for a tilt-cab truck, said latch mechanism comprising:

a latch pin adapted for mounting on a tilting cab or on a cab chassis, said latch pin having a generally cylindrical shaft portion and a head portion connected at one end of said shaft portion, said head portion being larger in diameter than said shaft portion; and

a latch locking assembly adapted for mounting on the other of said tilting cab or said cab chassis in position to engage said latch pin, said latch locking assembly having

a housing with a top section, a bottom section and two side sections,

a sliding latch arrangement disposed in said housing for sliding movement in a direction generally perpendicular to the motion of said latch pin as it moves into and out of engagement with said latch locking assembly, said sliding latch arrangement comprising

two side walls slidingly and guidingly received within said side sections of said housing;

a bottom plate connected to said side walls, said bottom plate having a first slotted section of sufficient size to receive said shaft portion of said latch pin and a second slotted section of sufficient size to receive said head portion of said latch pin; and

a first end wall and a second end wall,

a compression spring positioned against said first end wall of said sliding latch arrangement and biasing said sliding latch assembly in a first direction toward a position of engagement with said latch pin;

a piston housing positioned within said housing of said latch locking assembly and having a piston bore,

a piston disposed within said piston bore of said piston housing, said piston being hydraulically actuated so that upon introduction of hydraulic pressure into said piston bore said piston contacts said second end wall of said slding latch arrangement and moves said sliding latch arrangement in a second direction opposite to said first direction to disengage said sliding latch arrangement from said latch pin when it is desired to move said latch pin and said latch locking assembly apart from each other; and

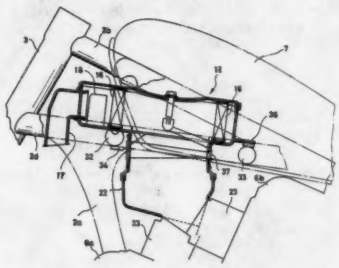
a latch locking plate pivotally secured to said side sections of said housing of said latch locking assembly and disposed within said housing to engage said second end wall of said sliding latch arrangement when said sliding latch assembly has moved sufficiently in said second direction to permit separation of said latch pin from said latch locking assembly and to hold said sliding latch assembly against the urging of said compression spring in a position in which said sliding latch arrangement cannot engage said latch pin after removal of hydraulic pressure from said piston bore until said latch locking plate is separated from said second end wall by said latch pin, whereupon said compression spring returns said sliding latch assembly into engagement with said latch pin.

4,509,613

MOTORCYCLE AIR CLEANER ARRANGEMENT

Ken Yamaguchi, Saitama, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 17, 1982, Ser. No. 419,295
Claims priority, application Japan, Sep. 19, 1981, 56-148251
Int. Cl.³ B62D *61/02*
U.S. Cl. 180—219 **11 Claims**



1. In a motorcycle having an engine, a frame, a fuel tank, and an air cleaner, the improvement comprising; said air cleaner positioned below a bottom wall of, and at a front portion of said fuel tank; and said frame provided with a head pipe, at least one upper main pipe extending in the vicinity of said bottom wall of said fuel tank and connected to said head pipe, and a pair of lower main pipes positioned above said engine and connected to said upper pipe adjacent to a rear half portion of said fuel tank, said air cleaner being disposed within a space defined by said head pipe, said upper main pipe and said pair of lower main pipes.

4,509,614

WORKING VEHICLE EQUIPPED WITH ENGINE AUTOMATIC STOP DEVICE

Niro Bando; Kazuaki Kurohara; Yasuo Fujima, all of Sakai; Fumihiro Ikeda, Osaka; Kenzo Usiro, Sakai, and Hiroyuki Ogasawara, Izumi, all of Japan, assignors to Kubota Ltd., Osaka, Japan

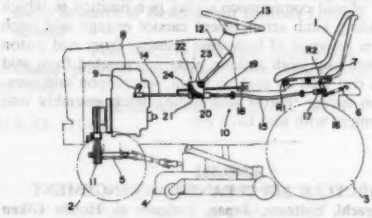
Filed May 6, 1983, Ser. No. 492,249
Claims priority, application Japan, Dec. 13, 1982, 57-218082
Int. Cl.³ B60R *21/00*
U.S. Cl. 180—273 **5 Claims**

1. A working vehicle equipped with an automatic engine stopping device, comprising:

an engine stopper mechanism including (a) a sitting sensor having a sensor arm and a spring and adapted to push up a seat when a load applied to the seat is below a predetermined amount, (b) engine stopper means to stop an engine in response to an upward pushing action of said sitting sensor, (c) a wire having one end thereof connected to

said sensor arm, and (d) a rod having one end thereof connected to said engine stopper means, said rod and said wire being interconnected at the other end of each through link means attached thereto, respectively,

clutch operating means for engaging and disengaging a clutch disposed in a transmission system for a power takeoff shaft, and



restraining means including a restraining member provided on said link means and said clutch operating means, said restraining means for preventing said link means from moving in a first direction to permit said seat to be upwardly pushed while yet permitting said link means to move in a second direction, opposite to said first direction, when said clutch operating means is in a clutch-disengaging position.

4,509,615

MULTI-CHAMBER ENCLOSURE FOR LOUDSPEAKERS

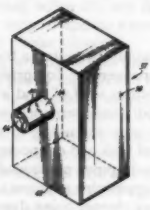
John O. Hruby, 1240 Alta Paseo, Burbank, Calif. 91501

Filed Feb. 4, 1980, Ser. No. 118,596

The portion of the term of this patent subsequent to Jan. 3, 2001, has been disclaimed.

Int. Cl.³ H04R *1/28*

U.S. Cl. 181—148 **12 Claims**



1. A loudspeaker enclosure comprising a primary chamber defining a principal interior volume and a secondary chamber defining a minor interior volume substantially smaller than the principal interior volume, the primary chamber having a front wall with outer and inner faces, the inner face forming a front boundary of selected height and width dimensions for the principal volume, the secondary chamber comprising an elongated housing essentially permanently sealed to the front wall of the primary chamber and projecting beyond at least one of the faces of the primary chamber front wall, the secondary chamber housing defining a speaker mounting opening which opens essentially directly to the exterior of the enclosure from a front boundary of the minor volume, the enclosure defining a second simple opening that opens simply and directly from the minor interior volume only to the principal interior volume substantially coaxially of the speaker mounting opening through a rear boundary of the minor interior volume, the speaker mounting opening being the only opening from the combination of the primary and secondary chambers to the exterior of the enclosure, the second opening having height and width dimensions which are less than and are in directions respectively parallel to the height and width dimensions of the principal volume front boundary, the minor volume between the speaker mounting and second openings having a length dimension substantially greater than the length of a loudspeaker mountable in the speaker mounting opening.

4,509,616

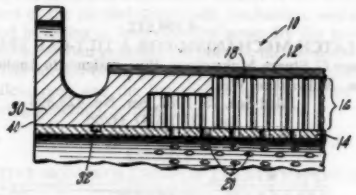
ACOUSTICAL LINERS

Sol S. Blecherman, Newington, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed May 2, 1983, Ser. No. 490,950

Int. Cl.³ B64D *33/02*

U.S. Cl. 181—214 **1 Claim**



1. For an acoustical liner, having a cylindrical porous sheet, a spaced concentric hard nonporous sheet and a concentric honeycomb material sandwiched between said porous sheet and said hard nonporous sheet, means for preventing separation of said porous sheet, flange means for mounting said liner adjacent the inner surface, of a duct carrying air so that the grazing flow is adjacent said porous sheet, said porous sheet extending axially from said honeycomb material and having a contiguous surface in contact with a coplanar surface formed on said flange means, adhesive means between said porous sheet and said coplanar surface, the improvement comprising a groove lateral to the flow of air spaced from the front edge of said porous sheet formed in said contiguous surface facing said adhesive means whereby said groove provides a weakened joint for breaking off the front portion of said porous sheet in the event of peeling thereof to avoid the entire sheet from peeling and separating from the remaining portion of said acoustical liner and said means for preventing separation includes a fillet formed adjacent the side walls of said grooves formed by the adhesive of said adhesive means migrating thereto upon assembly of said porous sheet.

4,509,617

STAIR HAVING ALTERNATE HALF TREADS

James M. Lapeyre, New Orleans, La., assignor to The Laitram Corporation, New Orleans, La.

Continuation-in-part of Ser. No. 257,960, Apr. 27, 1981, abandoned. This application Jul. 26, 1982, Ser. No. 402,219

Int. Cl.³ E06C *9/02*; B63B *29/20*

U.S. Cl. 182—93 **7 Claims**

1. A stairway comprising:

first and second spaced, parallel side tread supports adapted for mounting between an upper level and a lower level at a predetermined angle of inclination;

a central tread support having an outer edge, said central support disposed between said side supports and parallel thereto;

a plurality of first spaced tread members extending laterally between the first side tread support and said central tread support, each of said first tread members having a foot support portion;

a plurality of second spaced tread members extending laterally between said central tread support and the second side tread support, each of said second tread members being disposed between adjacent ones of said first tread

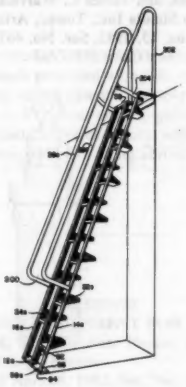
members in an alternating relationship therewith, each of said second tread members having a foot support portion;

each of said foot portions on the first and second tread members having a forward edge, a lateral inner edge, a lateral outer edge and a rear edge;

first and second handrails each supported on a respective side of the tread members and disposed in a plane forward and parallel to a plane passing through the forward edges of the foot support portions, the handrails positioned at a height in relation to the foot support portions to lie under the armpits and support the forearms of a user while descending the stairway;

said first tread members being of substantially identical construction, the first tread members being complimentary to the second tread members;

said tread members integrally formed as a single unitary structure, each tread member including:



an upwardly extending flange at the inner and outer lateral edges and the rear edge of the foot support portion, and having mounting portions for attaching the tread member to respective side and central tread support members; and

a downwardly extending flange at the forward edge of the foot support portion, said downwardly extending flange having side portions for attaching the tread member to respective side and central supports;

said first and second tread supports comprising first and second right angle members with an inner angle surface and an outer surface, said central tread support comprising a U-shaped member having an inner surface and an outer surface;

said mounting portions of the upwardly extending flanges of the first and second tread members adapted to confront the inner angle surface of the respective first and second right angle members and the inner surface of the U-shaped member.

4,509,618

OIL LUBRICATION SYSTEM, ESPECIALLY FOR KNITTING MACHINES

Falk Kühn, Rottenburg, Fed. Rep. of Germany, assignor to Erich Roser, Salem-Grasbeuren, Fed. Rep. of Germany

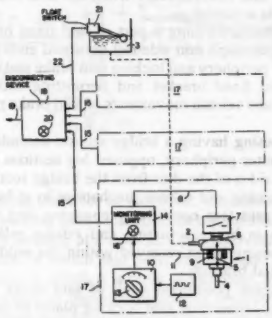
Continuation-in-part of Ser. No. 180,988, Aug. 25, 1980, Pat. No. 4,349,085. This application Mar. 2, 1982, Ser. No. 353,891

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1981, 3108836

Int. Cl.³ F01M *1/22*; **G08B** *21/00*

U.S. Cl. 184—6.4 **3 Claims**

1. An oil lubricating system comprising an electro-magnetically driven piston pump having a pump intake and a pump outlet for pumping lubricating oil from an oil storage reservoir to a lubrication site, said pump having a pump piston, an exciting coil responsive to current pulses for moving the pump piston from a first position to a second position to effect the circulation of lubricating oil from the reservoir to the lubrication site, means for producing periodic current pulses, means for applying said periodic current impulses to said exciting coil, each pulse causing the pump piston to move between said first and second positions in response to said current pulses, means coupled to said pump for sensing when the pump piston reaches said second position in response to the application of a current pulse and producing a first control signal indicative of



the pump piston reaching said second position, monitoring means responsive to said current pulses and said first control signal for providing a second control signal indicative of improper operation of said piston pump, said monitoring means monitoring the time between receipt of one of said current pulses and the receipt of a corresponding first control signal after the application of said one of said current pulses, and if said first control signal is not received within a predetermined period of time after said one of said current pulses, producing said second control signal indicating that said piston pump is operating improperly.

4,509,619

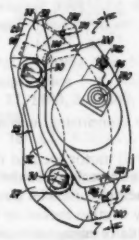
SHOE MOUNTED DISC BRAKE CALIPER AND SHOE SUPPORT STRUCTURE

Gene P. Baynes, Kettering, and Wolfgang Melinat, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 17, 1982, Ser. No. 389,428

Int. Cl.³ F16D *55/18*

U.S. Cl. 188—73.39 **2 Claims**



2. A disc brake caliper assembly for braking a rotatable disc, said caliper assembly comprising:

a fixed bracket forming a mounting saddle defined by opposed side rails having main body portions extending chordally along either side of an arcuate portion of the disc, said side rails having upturned ends extending beyond and across the disc outer periphery, said upturned

ends providing brake shoe torque-taking abutments and including arcuately spaced cross bars joining said side rail main bodies;

opposed brake pad assemblies including braking plates and friction lining material brake pads secured to said braking plates, said brake pad assemblies being positioned along either side of an arcuate portion of the disc in friction braking relation thereto, said brake pad assemblies being received within said fixed bracket and having complementary brake torque-transmitting abutments cooperating with said fixed bracket abutments to transmit braking torque to said fixed bracket when the disc brake caliper assembly is actuated;

removable means forming a part of said fixed bracket and extending through said side rail upturned ends across the disc outer periphery and locking said brake pad assemblies within said fixed bracket and permitting sliding brake actuating and release movements of said brake pad assemblies;

a caliper housing having a bridge section extending across the disc outer periphery, opposed leg sections extending along the sides of the disc from the bridge section, and a brake actuating and release mechanism in at least one of said legs, said legs operatively engaging said brake pad assemblies in brake actuating and release relation, said caliper housing being received within the saddle formed by said fixed bracket;

mounting means positioned back of said brake pads and operatively connecting said backing plates to said caliper housing to mount one leg section of said caliper housing on one brake pad assembly and the other leg section of said caliper housing on the other brake pad assembly so that said caliper housing is supported on said fixed bracket only by said brake pad assemblies at points in alignment with said brake pads and the arcuate portion of the disc in friction braking relation with said brake pads.

4,509,620

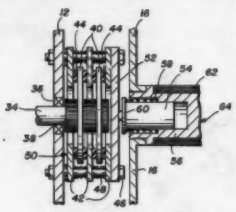
HOIST OR THE LIKE

Stephen P. Verbos, Muskegon, Mich., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 8, 1982, Ser. No. 356,009

Int. Cl.³ B60T *13/04*; B60L *7/00*; F16D *19/00*; H01H *51/34*

U.S. Cl. 188—171 **7 Claims**



1. An improved hoist comprising in combination:

a housing;

an electrically powered motor located in the housing;

a shaft journaled in the housing and driven by the motor;

braking means including rotatable friction means on the shaft and stationary friction means on the housing that are arranged to be mutually engageable to prevent rotation of the shaft;

solenoid means on said housing including biasing means urging said friction means toward engagement, said solenoid means being operative to enable disengagement between said friction means when energized and permitting engagement therebetween when deenergized;

electrical switch means operable in a portion of the electrical circuit remote from the power input to said motor and at a reduced voltage as compared to said motor input, said switch means being connected to contacts operable when actuated to energize and deenergize said motor; and

electrical control means energized and deenergized by said switch means in a parallel circuit relation with the contacts for said motor, said control means being connected with said solenoid means for energizing said solenoid means at a high power level and including power reduction means for decreasing the power supplied to said solenoid means at a predeterminable time after said solenoid means is energized thereby reducing the power consumption of said solenoid during operation of the hoist.

4,509,621

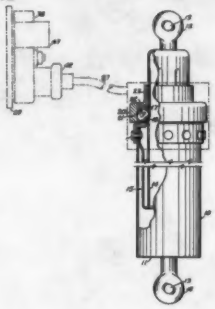
VARIABLE-LOAD ENERGY ABSORBER AND METHOD FOR MAKING ENERGY ABSORBERS HAVING VARIABLE-LOAD CAPABILITY

Stanley P. Desjardins, and James C. Warrick, both of Tempe, Ariz., assignors to Simula Inc., Tempe, Ariz.

Filed Aug. 13, 1982, Ser. No. 407,917

Int. Cl.³ F16F *7/12*

U.S. Cl. 188—372 **6 Claims**



1. A variable-load energy absorber comprising:

an inversion tube, wherein the tube is partially turned outside in, so that the uninverted portion is external to the inverted portion and surrounds and is parallel thereto;

annular support means attached to said external uninverted tube for attaching it to other structures;

means attached to the internal inverted end of the tube for attaching it to other structures; and

means surrounding the tube and attached to said annular support means for constricting the inverted tube to the extent desired.

4,509,622

SUITCASE

Dieter Morszeck, Kinkelstr.16, 5000 Koeln 41, Fed. Rep. of Germany

Filed Jul. 14, 1983, Ser. No. 513,982

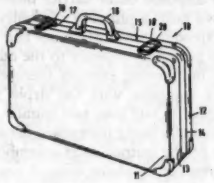
Claims priority, application Fed. Rep. of Germany, Nov. 15, 1982, 3242265

Int. Cl.³ A45C *5/04*

U.S. Cl. 190—119 **7 Claims**

1. A suitcase, comprising a first shell having a top surface provided with a first indentation; a second shell having a further top surface provided with a second indentation, the second shell being hingedly connected to the first shell so that the first and the second shells are movable between an open and a closed position wherein the first and the second indentations define a common indentation of predetermined contour when the first and second shells are moved into the closed position; and means for locking the first and the second shells when the latter are in the closed position, the locking means including two locking members cooperating with each other, wherein

one of the two members is connected to one of the shells and the other of the two members is connected to the other of the shells, the first and the second indentations having such a depth that upon locking the first and second shells in the closed position, the locking means is completely enclosed within the common indentation without projecting beyond the top surface and the further top surface of the first and second shells,



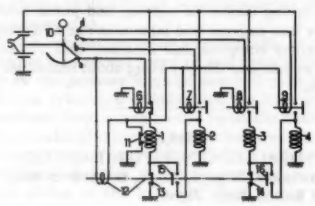
the first and the second shell each having a circumferential edge and being each provided along its circumferential edge with a profile strip which extends within a respective indentation and has therein a contour corresponding to the contour of the respective indentation so as to form a loop-shaped bending, said common indentation extending across both shells and the profile strip.

4,509,623

RETARDER EQUIPMENT FOR VEHICLES

André Marandet, Saint-Gratien, France, assignor to Labavia S.G.E., Bois-D'Arcy, France

Filed Apr. 29, 1982, Ser. No. 373,060
Claims priority, application France, May 5, 1981, 81 08921
Int. Cl.³ F16D *66/00*
U.S. Cl. 192—4 A **2 Claims**



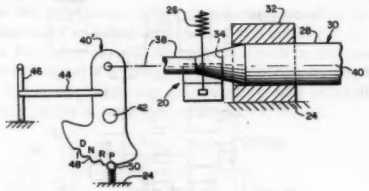
1. Retarder equipment for vehicles comprising an eddy-current retarder which comprises 2n inductor windings, n being an integer at least equal to 2, a DC voltage source, control means actuated by an actuating member with 2n+1 positions for normally causing the retarder to generate 2n+1 distinct braking torques, which torques have values increasing from zero to a maximum value when the actuating member goes over from its zero position to its 2n position, which results in connecting respectively in parallel to the DC voltage source a number of independent windings increasing from zero to 2n, and means for under-energizing the retarder by automatically connecting its windings in series two by two, the means for under-energizing the retarder being responsive to overshooting of a given threshold by a temperature of a rotor armature of the retarder, said means for under-energizing comprising a thermosensitive element mounted on a stator of the retarder at a position of said stator in front of which passes said rotor armature.

4,509,624

PARKING BRAKE SAFETY MECHANISM FOR AUTOMATIC TRANSMISSIONS

William A. Barr, Gibson Island, Md. 21056

Continuation of Ser. No. 363,080, Mar. 29, 1982,. This application Jul. 17, 1984, Ser. No. 631,793
Int. Cl.³ B60K *41/26*
U.S. Cl. 192—4 A **15 Claims**



1. A parking brake for an automatic transmission comprising a toothed parking gear secured to an output shaft journaled in a stationary housing of a vehicle, a pawl movable in between a park position in which said pawl engages said gear and non-park position in which it is clear of said gear, driver operated means movable in opposite directions between park and reverse positions, a control rod connected to said driver operated means, cam means operated by said control rod and engageable with said pawl to effect movement thereof towards said parking gear when said driver operated means is moved to its park position and to effect movement of said pawl clear of said gear when said driver operated means is moved to its reverse position, lost motion means between said driver operated means and said pawl enabling said driver operated means to be moved to its park position when said pawl engages the surface of a tooth of said parking gear intermediate spaces on either side of said tooth, and resilient means arranged to re-act against said control rod when the driver operated means in cooperation with said lost motion means is accidently positioned intermediate its park and reverse positions, to exert a force on said driver operated means which at all times while the latter is in said intermediate position restrains movement thereof from said intermediate position towards its reverse position while tending to move said driver operated means in a direction away from its reverse position and towards its park position.

4,509,625

AUTOMATIC FRICTION CLUTCHES AND CONTROLS THEREFOR

Rudy Tellert, Schweinfurt, Fed. Rep. of Germany, assignor to Sachs-Systemtechnik GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Jul. 21, 1981, Ser. No. 285,548
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1980, 3028250; Nov. 17, 1980, 3043347; Nov. 17, 1980, 3043348; Apr. 24, 1981, 3116455
Int. Cl.³ F16D *25/12*
U.S. Cl. 192—0.033 **22 Claims**

1. For a motor vehicle having an engine and a friction clutch driven by the engine, a device for actuation of the friction clutch, comprising:

an actuation element for said clutch;

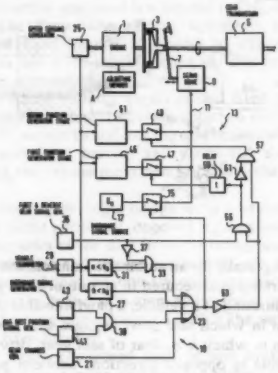
a positioning servo drive means for moving said actuating member between a disengagement position in which the clutch is disengaged and a full engagement position in which the clutch is completely engaged and through an adustable slippage range of engagement positions between a threshold position at the start of torque conversion and the full engagement position;

a speed sensor means for producing a speed signal corresponding to the positioning of the engine;

a position control means for controlling the operation of said drive;

a function generator means for said position control means for generating a predetermined speed-position characteristic between the engine speed and the engagement position;

characterized in:



the position control means being arranged to adjust said actuation member in the slippage range between said threshold position and said full engagement position in response to the speed of the engine according to a characteristic set by the function generator means such that for each engine speed there is a unique position of the actuating members.

4,509,626

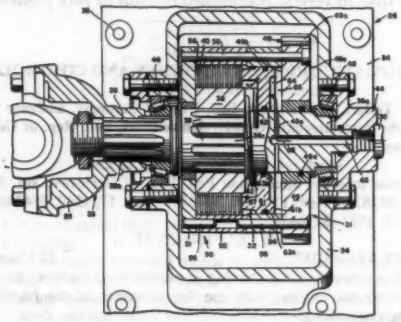
HYDRAULICALLY ACTUATED HIGH TORQUE, QUICK ENGAGEMENT CLUTCH ASSEMBLY

Donald D. Jones, Elwood, Ill., assignor to Elwood Manufacturing Company, Elwood, Ill.

Filed May 27, 1982, Ser. No. 382,478

Int. Cl.³ F16D *25/063*

U.S. Cl. 192—85 AA **7 Claims**



1. For transmitting power from the transmission of a two-wheel drive vehicle to an auxiliary drive axle for the vehicle to thereby convert the vehicle to a four-wheel drive vehicle, a clutch assembly comprising, in combination, a clutch casing mounted on the vehicle; an output shaft assembly having an output shaft and means for rotatably mounting the shaft in said clutch casing, a hub secured to a mid-portion of the output shaft, a plurality of axially spaced, annular separator plates extending outwardly from and slidably secured along their inner periphery directly to the output shaft hub without any intervening element therebetween, said separator plates being rotatable with the output shaft hub and axially slidable with respect thereto; means for drivingly connecting one end of the output shaft to the auxiliary two-wheel drive axle for the vehicle; a drive gear assembly including a drive gear disposed within said clutch casing and rotatably mounted on the other end of said output shaft, said drive gear having inner and outer faces, an axially disposed outer carrier member rotatably secured to the drive gear, a plurality of axially spaced, annular friction plates extending inwardly from and slidably secured along their outer periphery directly to the outer carrier member without any intervening element therebetween, said friction plates being rotatable with the drive gear and axially slidable with respect to said hub; said annular friction plates of the drive gear assembly being interposed between said annular separator plates of the output shaft assembly so that lateral motion of said respective plates toward one another causes clutching action of the drive gear and output shaft; means for drivingly connecting said drive gear through its gear teeth to the vehicle transmission; and coupling means for drivingly connecting said drive gear assembly to said output shaft assembly, said coupling means including an annular piston rotatably disposed within a piston housing and rotatably mounted on said output shaft and interposed between said drive gear and said output shaft hub, said piston having inner and outer faces and being laterally movable along the output shaft, said outer piston face being annular in shape and defining therewithin a cup-shaped recess and disposed to directly engage the innermost one of said separator plates carried by the output shaft assembly when the clutch is actuated without any intervening element therebetween for obstructing immediate lockup of said piston face and separator plate, coil spring means for normally maintaining the piston disengaged from said innermost separator plate and thus in a disengaged position of the clutch, said coil spring means surrounding said output shaft and disposed within said cup-shaped recess and interposed between the piston and said output shaft hub without any intervening element therebetween, said inner piston face cooperating with said outer face of said drive gear to define therebetween a chamber for hydraulic fluid, and means for applying hydraulic fluid under pressure within said chamber to overcome the bias of said coil spring means for moving said piston laterally so that its outer face engages said innermost one of the separator plates to thereby compress said separator and friction plates together to actuate and thereby bring about immediate lockup of the clutch.

4,509,627

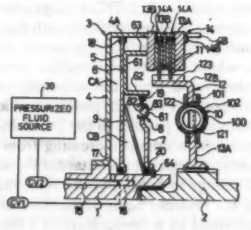
HYDRAULIC CENTRIFUGAL CLUTCH

Matsumi Kawamoto, Nagoya, Japan, assignor to Aisin Warner Kabushiki Kaisha, Anjo, Japan

Filed Aug. 3, 1982, Ser. No. 404,729

Int. Cl.³ F16D *25/063, 43/284*

U.S. Cl. 192—85 F **14 Claims**



1. A hydraulic centrifugal clutch, comprising:

an input shaft;

an output shaft;

a hydraulic servomechanism including a first fixed member fixed to said input shaft, a movable member axially slidable with respect to the said input shaft, a first cylindrical chamber formed between said first fixed member and said movable member and adapted to receive a hydraulic fluid therein from a source of hydraulic fluid at a predetermined pressure for moving said movable member in one axial direction of said input shaft, and a second cylindrical chamber having a pressure receiving area smaller than the pressure receiving area of said first cylindrical chamber, said second cylindrical chamber being formed between a second fixed member and said movable member and adapted to move said movable member in the other axial direction of said input shaft at the reception of said hydraulic fluid therein, said first and second cylindrical chambers and the fluid therein rotating with said input shaft, the pressure of said fluid increasing due to a centrifugal force in proportion to the rate of rotation of said input shaft;

centrifugal check valve means including a valve casing being received in a through hole formed in said second fixed member, a valve port formed in said valve casing for allowing said second cylindrical chamber to communicate with the outside of the second cylindrical chamber and a check ball movably received in said valve casing and adapted to be moved for closing said valve port by the pressure of said fluid within said second cylindrical chamber when said pressure is greater than a predetermined value and said check ball being adapted to move radially outward within said valve casing for opening said valve port by means of a centrifugal force acting on said check ball when the pressure of said fluid within said second cylindrical chamber is smaller than the predetermined value;

a clutch mechanism interposed between said input shaft and said output shaft and adapted to be engaged to connect said output shaft to said input shaft by movement of said movable member as a result of said hydraulic fluid pressure generated within said first chamber;

bias means for applying a force counteracting the force applied to said movable member by the hydraulic fluid within said first cylindrical chamber, said counteracting force being applied to said movable member of said servomechanism; and

said clutch mechanism being automatically engaged or released at a rotational speed of said input shaft where the sum of the pressure force of said hydraulic fluid within said first cylindrical chamber and the force generated by centrifugal force acting on said hydraulic fluid within said first cylindrical chamber counterbalances the sum of the pressure force of said hydraulic fluid within said second cylindrical chamber, the force generated by centrifugal force acting on the hydraulic fluid within said second cylindrical chamber, and the force of said bias means.

4,509,628

FREE-WHEELING CONTROL SYSTEM FOR A MOTOR VEHICLE

Erich Junginger; Norbert Rittsmannsberger, both of Stuttgart, and Eberhard Schnaibel, Hemmingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jul. 15, 1982, Ser. No. 398,349

Claims priority, application Fed. Rep. of Germany, Jul. 23, 1981, 3130453

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.094 **7 Claims**

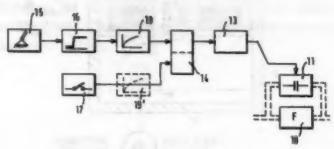
1. Free-wheeling control system for a motor vehicle having an engine, a drive train, driving wheels, brakes, an accelerator pedal and a brake pedal and having interposed, in its power train between the engine and the driving wheels of the vehicle, overrunning clutch means (10,12) for free-wheeling one-way transmission of rotary power from the engine to the drive wheels and controllable clutch means (11, 12) which is disengageable to permit free wheeling and engageable to assure transmission of rotary power between the drive wheels and the engine in either direction, said sytem comprising:

means for producing a first signal corresponding to a change of engine operation away from an idling operation;

means for producing a second signal corresponding to the onset of operation of the brakes in response to said brake pedal;

means for producing a third signal corresponding to the existence of an idling operation of said engine;

means for engaging said controllable clutch in response to said first signal to a change of engine operation away from an idling operation and for engaging said controllable clutch means in response to said second signal;



means for releasing said controllable clutch means in response to appearance of a third signal representative of the existence of an idling operation of said engine, means for averaging said third signal for delaying the release of said clutch with respect to the beginning of idling operation of said engine, and

means (14) for keeping said controllable clutch means engaged after a completed operation of said engaging means until operation of said releasing means and for keeping said controllable clutch released after a completed operation of said releasing means until an operation of said engaging means.

4,509,629

PLURAL MOTOR PLURAL CLUTCH WITH WORM DRIVE

Jan Pajgrt; Jan Bezdicek, and Jiri Novak, all of Brno, Czechoslovakia, assignors to ZVS Vyzkumnevyvojovy Ustav, koncernova ucelova organizace, Brno, Czechoslovakia

Filed Dec. 15, 1982, Ser. No. 450,122

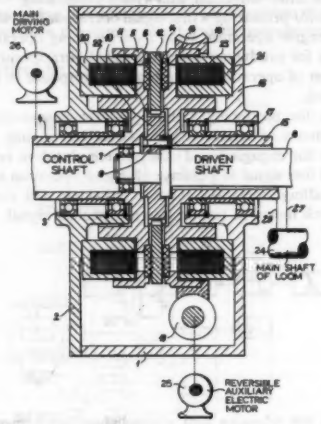
Claims priority, application Czechoslovakia, Dec. 16, 1981, 9365-81

Int. Cl.³ B60K *41/28*

U.S. Cl. 192—0.098 **5 Claims**

1. A clutch mechanism adapted for use with looms, comprising a housing, a pair of opposed, coaxially disposed electromagnets stationarily mounted in the housing, a driven shaft disposed coaxial of the electromagnets, a friction disc mounted on the driven shaft between the electromagnets, the friction disc being mounted for axial displacement on the driven shaft, a control shaft mounted coaxially of the driven shaft, a main motor for driving the control shaft, a rotor fixedly connected to the control shaft disposed between one electromagnet and the friction disc for selective driving engagement with the friction disc, a second rotor provided with a frictional surface adapted for selective driving engagement with the other side of the friction disc, said second rotor being disposed between the second electromagnet and the friction disc, said second rotor being fixed to a hollow shaft which freely surrounds the driven shaft and is rotatably mounted in the housing of the clutch

mechanism, one of said first and second rotors being drivingly connected with a worm wheel, a worm having meshing driv-



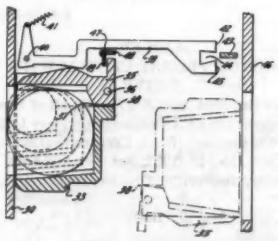
ing engagement with the worm wheel, and an auxiliary prime mover drivingly connected with the worm.

4,509,630

MULTI-COIN COIN CHUTE

Julio Mongelli, 96 Roehrs Dr., Wallington, N.J. 07057

Filed Jun. 7, 1982, Ser. No. 386,117
Int. Cl.³ G07F *5/06*
U.S. Cl. 194—1 G **7 Claims**



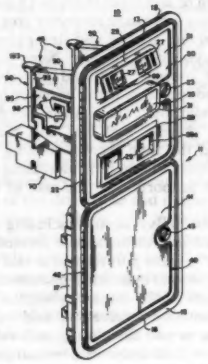
1. An improved coin chute of the type which accepts a set combination of coins, calipers said coins and actuates a coin-operated machine such as a clothes washer or dryer, wherein the improvement comprises a coin housing having a multiplicity of coin receiving slots up to ten or more allowing said machine actuation by any set amount from five cents to ten dollars or more; said coin housing pivotally mounted on a movable frame wherein the transfer of coins to a cash receptacle acheived by a combined linear translation motion and a rotational motion of said coin housing followed by gravity drop of the coins; said coin receiving slots calipering coins for acceptability; means for releasing coins when set amount of coins not satisfied with all acceptable coins; and means for actuating the machine.

4,509,631

COIN DOOR ASSEMBLY

Syng N. Kim, Hoffman Estates, Ill., assignor to Wico Corporation, Niles, Ill.

Filed Nov. 26, 1982, Ser. No. 444,530
Int. Cl.³ G07F *9/10*
U.S. Cl. 194—1 A **19 Claims**



1. In a coin receiving assembly including a support panel having a coin receiving opening therein, a coin acceptor module with a coin path therethrough for distinguishing between acceptable and unacceptable coins, and an entry chute mounted on the support panel and projecting therefrom and in communication with the coin receiving opening, the improvement comprising: coin box means having an inlet and mounted on the support panel, said coin box means being spaced from the entry chute and projecting from the support panel in the same direction as the entry chute and cooperating with the support panel and the entry chute for defining therebetween a receptacle for the coin acceptor module, the coin acceptor module being freely receivable in said receptacle in a coin accepting position wherein the coin path thereof is disposed in communication with the entry chute and with the inlet of said coin box means, and retaining means adapted for releasably interconnecting the entry chute and said coin box means for cooperation therewith substantially immovably to retain the coin acceptor module in said receptacle.

4,509,632

TOKEN AND ACCEPTANCE MECHANISM

Myron I. Jaffe, Chestnut Hill, Mass., assignor to Sintered Metals, Inc., Boston, Mass.

Continuation of Ser. No. 321,721, Nov. 16, 1981, abandoned.
This application Oct. 19, 1983, Ser. No. 543,384
Int. Cl.³ G07F *7/00*
U.S. Cl. 194—4 D **21 Claims**

1. In combination, a disk-shaped token having

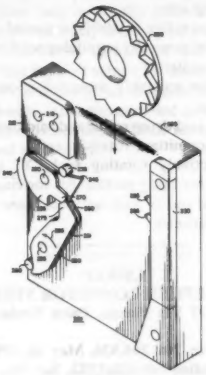
a first section and a second section disposed perpendicularly to the axis of said token, said first section having a notched periphery and said second section layer having a smooth periphery, and a token acceptance mechanism comprising:

means for defining a slot in said token acceptance mechanism through which said token moves,

means responsive to said notched periphery for enabling said acceptance mechanism, comprising a plurality of teeth, including at least one fixed tooth located on one side of said slot and at least one movable tooth on the other side of said slot, whereby a token with a notched periphery entering said token acceptance mechanism causes movement of said movable tooth, and

means, when enabled, responsive to said smooth periphery for accepting the token, said acceptance means comprising a movable arm, said arm being responsive to the move-

ment of said movable tooth and to said smooth periphery for moving in a direction to allow said token to move through said token acceptance mechanism, whereby only



tokens having both a notched periphery section and a smooth periphery section will be accepted by the token acceptance mechanism.

4,509,633

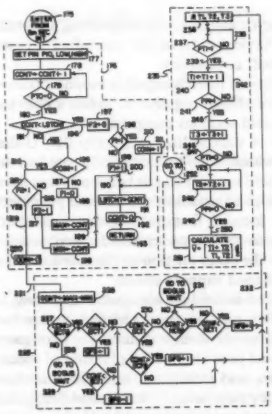
ELECTRONIC COIN VALIDATOR WITH IMPROVED DIAMETER SENSING APPARATUS

Edmund E. Chow, Lilburn, Ga., assignor to Reed Industries, Inc., Stone Mountain, Ga.

Filed Aug. 24, 1983, Ser. No. 525,997

Int. Cl.³ G07F *3/02*

U.S. Cl. 194—100 A **7 Claims**



1. In an electronic coin validator of the type including a content measuring apparatus for measuring the metal content of a coin as it travels along a predefined path, an improved diameter measuring apparatus comprising in combination:

a first electronic coin sensor located along said path;

a second electronic coin sensor, spaced apart a predetermined distance from said first electronic coin sensor, along said path;

timing means connected to said first and second electronic coin sensor for measuring, and storing in a memory, three distinct time intervals between a first event corresponding to the leading edge of said coin being sensed by said first electronic coin sensor and a second event corresponding to the trailing edge of said coin being sensed by said second electronic coin sensor;

calculating means connected to said memory for providing a calculated average velocity of said coin as it passed said first and second electronic coin sensors, and for subsequently calculating an effective diameter of said coin in response to said calculated average velocity and one of said three distinct time intervals;

storage means for storing a plurality of predetermined ranges of diameter values;

comparison means connected to said calculating means and said storage means for comparing said effective diameter to said plurality of predetermined ranges of diameter values and for providing a valid diameter output signal in response to detection of said effective diameter being within one of said plurality of predetermined ranges of diameter values.

4,509,634

BUFFER STORAGE APPARATUS

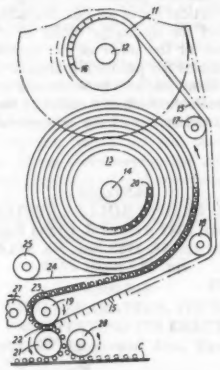
Kenneth G. Payne, Chislehurst, England, assignor to Sasib S.p.A., Bologna, Italy

Filed Jan. 6, 1982, Ser. No. 337,483

Claims priority, application United Kingdom, Jan. 12, 1981, 8100840

Int. Cl.³ B65G *1/00*

U.S. Cl. 198—347 **7 Claims**



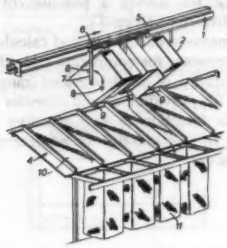
1. A buffer storage apparatus for receiving a product normally carried by a product conveyor along a path from one location to another, comprising: an elongated reservoir belt movable in the direction of its elongation from a stowed position, past a predetermined region to receive the product and thereafter to a product storage position; a pair of wheels around which the elongate reservoir passes and between which there exists a linear transfer region which is arranged to align with the forward feed product path of the product conveyor during buffer storage demand; pusher means at said transfer region for moving the product laterally in relation to said reservoir belt to transfer the product from the conveyor to the reservoir belt during buffer storage demand; levers to support said pair of wheels and to shift said wheels from said transfer region to a return region so that the linear transfer region of the belt is aligned with a return run of the conveyor; and further pusher means for moving said product laterally from the linear transfer region of said reservoir belt to said conveyor.

4,509,635

SORTING SYSTEM

Robert M. Emsley, Harpenden, and Derek C. Pitt, London, both of England, assignors to The Post Office, London, England

Filed Jan. 13, 1983, Ser. No. 457,518
Claims priority, application United Kingdom, Jul. 12, 1982, 8220211
Int. Cl.³ B65G *43/10, 47/46*
U.S. Cl. 198—365 12 Claims



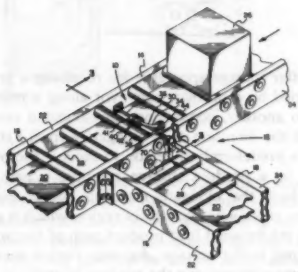
1. A sorting system for generally flat articles comprising a conveyor, a plurality of receptacles carried by said conveyor and individually disposed to receive and convey an article to be carried with the surface of maximum size of the article perpendicular to the line of travel of the conveyor, each of the receptacles including a controllable discharge outlet and each of said receptacles being disposed to lie in one or the other of first and second inclined positions in which the receptacle is inclined to the vertical about an axis extending lengthwise of the conveyor and the discharge outlet of the receptacle is positioned on one or the other of the opposite sides of the conveyor, and means for permitting angular displacement of each receptacle about said axis between said inclined positions so that the controllable discharge outlet of the receptacle can be positioned on either one of the opposite sides of the conveyor.

4,509,636

DIVERTING ROLLER SYSTEM

Arthur G. Godbois, 2241 Avenue B, Grand Prairie, Tex. 75051

Filed Jul. 18, 1983, Ser. No. 514,449
Int. Cl.³ B65G *47/46*
U.S. Cl. 198—372 10 Claims



1. An apparatus for selectively diverting articles carried by a conveyor system of the type comprising a plurality of roller elements disposed in generally parallel spaced relationship defining a notional plane of conveyance and disposed upon an underlying drive member imparting a rotational motion to the rollers, wherein the diverting apparatus comprises:

an elongate housing adapted for mounting between adjacent rollers of said conveyor system and atop said drive member at a location where diverting of articles is to be effected, said housing comprising a generally "Y" shaped configuration including a linear body section and an angularly extending arm;

at least one drive roller rotatably mounted upon said linear body section in generally parallel spaced relationship with said adjacent rollers;

a diverting roller rotatably mounted upon said angularly extending arm;

means coupling said drive roller and said diverting roller for generally concomittant rotation; and

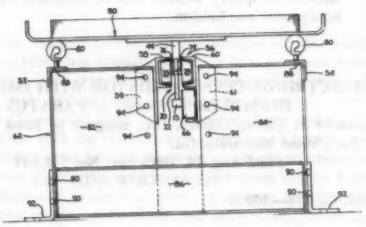
means for selectively rotating said "Y" shaped housing about said linear body section for moving said diverting roller into and out of said notional plane of conveyance for diverting articles.

4,509,637

BOLT TOGETHER CONVEYOR STRUCTURE

Jess Browning, 4217 Via Pinzon, Palos Verdes Estates, Calif. 90274

Continuation of Ser. No. 266,926, May 26, 1981, abandoned.
This application Sep. 28, 1983, Ser. No. 536,688
Int. Cl.³ B65G *37/00*
U.S. Cl. 198—472 6 Claims



1. A conveyor assembly for supporting a plurality of pallets, each pallet having a drive pin extending below the bottom surface thereof, comprising:

(a) a plurality of interchangeable modular conveyor sections which are affixed together to define a conveyor pathway, each of said sections comprising:

a plurality of standardized generally flat, U-shaped support stands which may be compactly stacked for shipment, each of said support stands being adapted for anchoring to a floor with adjustable elevation and provided with appropriately located first bolt holes adjacent the U-shaped opening in said support stands, and second bolt holes adjacent the outer portion of the upward extending legs of said U-shaped support stands;

a plurality of individual standardized trolley rails, each of said trolley rails having a channel section having at least one trolley rail mounting member permanently fastened thereto and provided with a plurality of spaced apart third bolt holes, said trolley rail mounting members of each of said trolley rails being bolted in said first bolt holes on one of the two opposite sides of the U-shaped opening of said support stands so that two channel sections are spaced apart facingly disposed parallel relationship and generally perpendicular to said support stands to define a conveyor path whereby a pallet drive pin may extend between and be guided by said channel sections;

(b) a flexible drive means, and a plurality of pairs of trolley wheels coupled within and guided by said facingly disposed channel sections, said trolley wheels being fastened to said flexible drive means at spaced apart positions so as to support said flexible drive means;

(c) pallet support means adjacent each side of said trolley rails for supporting a pallet on the conveyor assembly;

(d) a plurality of pallet engagement means coupled to said drive means for engaging said drive pins;

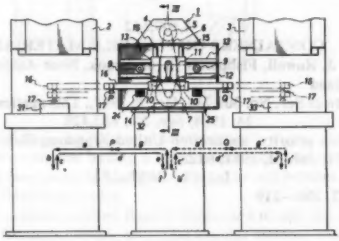
whereby said plurality of interchangeable modular conveyor sections may be readily assembled to define a desired conveyor pathway and may be readily disassembled, including disassembly of each of said individual trolley rails from said support stands for dense packing for transport or for redesigning the shape or location of the conveyor pathway, and a disassembled on site without requiring welding or other skilled labor for erection, alignment, leveling and adjustment.

4,509,638

CONVEYING SYSTEM FOR PRESS WORK MATERIALS

Yoshinori Kato, Otsuki; Makoto Matsui, and Zenichiro Nonaka, both of Kanagawa, all of Japan, assignors to Aida Engineering, Ltd., Kanagawa, Japan

Filed Mar. 29, 1983, Ser. No. 479,977
Claims priority, application Japan, Apr. 8, 1982, 57-58617
Int. Cl.³ B65G *47/91*
U.S. Cl. 198—486 **9 Claims**



1. A device for conveying materials, comprising:

a main body;

a moving member mounted on said main body for horizontal reciprocal movement with respect thereto;

a crank shaft rotatably mounted to said moving member for horizontal movement therewith;

a feed bar;

a feed bar guide supporting said feed bar for sliding horizontal movement of said feed bar;

a connecting rod connecting said feed bar guide to said crank shaft;

holding members mounted to opposite ends of said feed bar for holding the materials to be conveyed;

a belt having a horizontally extending upper portion;

a pair of pulleys mounted on said main body so as to support said belt with said upper portion extending horizontally for reciprocal movement about said pulleys; and

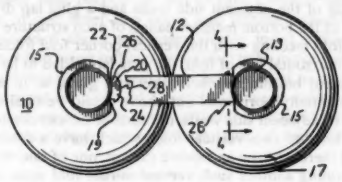
a revolving member mounted on said crank shaft and coupled with said upper portion of said belt so as to be moved horizontally between said pulleys and revolve at each pulley a pre-set angle about said each pulley in response to reciprocal movement of said belt, revolution of said revolving member rotating said crank shaft so as to vertically move said connecting rod, said feed bar guide and said feed bar, whereby said feed bar moves in vertical and horizontal directions when said belt is reciprocated.

4,509,639

MULTI-CONTAINER CARRIER PACKAGE AND A METHOD OF ASSEMBLY THEREFOR

Mortimer S. Thompson, Arlington, Mass., assignor to Tri-Tech Systems International Inc., West Springfield, Mass.

Filed Apr. 1, 1982, Ser. No. 364,243
Int. Cl.³ B65D *71/00*
U.S. Cl. 206—159 **22 Claims**



1. A two container carrier package in which the carrier is attached to the containers, comprising:

two containers, each of which includes an upper portion of reduced breadth and an integral attachment site with engaging means at said upper portion which restricts movement of the attached carrier about the container, and wherein said containers are adjacent one another with said reduced upper portions forming a space therebetween with said engaging means at said upper portions extending inwardly toward one another, and

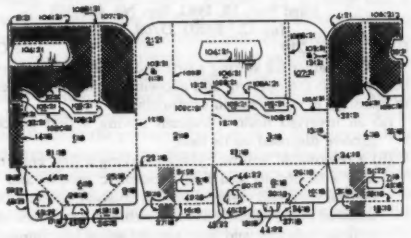
a hollow tubular carrier, which spans only the space between the reduced upper portions of adjacent containers and which substantially lies in the horizontal plane therebetween, and includes ends of resilient material having integral attachment sites, wherein said container engaging means are adapted to extend into said tube ends, and wherein said ends are adapted to be releasably deformed for interlocking said carrier attachment sites about said container engaging means so that said carrier can be gripped for lifting and carrying the assembled package without disengagement of said containers and, when desired, to release said interlocking carrier attachment sites and container engaging means so that said containers can be removed from said carrier.

4,509,640

CARTON WITH SEPARATERS, ITS BLANK AND APPARATUS FACILITATING ITS ERECTION FOR USE

Michael F. Joyce, 25 Rangewood Ave., Reading RG3 3NN, England

Filed May 28, 1981, Ser. No. 268,087
Claims priority, application United Kingdom, May 28, 1980, 8017393; Jun. 25, 1980, 8020811; Feb. 12, 1981, 8104349
Int. Cl.³ R65D *75/00*
U.S. Cl. 206—175 **24 Claims**



1. A collapsible carrier for articles constructed from a blank

of sheet material including a bottom comprising bottom member panels depending from the bottom edges of each of four side walls by a horizontal line of fold, each side wall hinged by a line of vertical corner fold to the next side wall, and when the carrier is folded flat into the collapsed condition and assembled two of the four said vertical corner folds lie between the two other vertical corner folds which are folded fully each with members adjacent to it forming a similar opposing structure, the adjacent bottom member panels folded to lie against the inside of the adjacent side walls and a glue lap divided from one of the bottom member panels of each structure by a diagonal fold meeting with the vertical corner fold folded fully and the horizontal line of fold, the glue lap folded to lie against the adjacent bottom member panel and glued to it, at least one substantially horizontal cut above a said vertical corner fold and its adjacent side walls, the ends of the cut connecting with the lines of two vertical folds which have a further vertical fold therebetween and above the cut, one of said vertical folds providing another such vertical corner fold upon said further vertical fold forming an internal corner by reverse folding the carrier material, means including a second substantially horizontal cut located above at least one of said fully folded vertical corner folds with the carrier material above the second cut being folded to reverse inwardly for forming separation for separating the upper parts of the articles carried and for accommodating a carrying opening, when the carrier is erected; characterised in that the free edge of at least one bottom member panel of each one of said similar opposing structures carries a separater forming extension hinging with the bottom member at a line of weakness parallel with the said horizontal line of fold and the line of weakness dimensioned to communicate with a said line of weakness of the similar opposing structure when erected and the height of the separater extensions dimensioned to finish below the carrying opening of the inwardly reversing carrier material when the carrier is collapsed, said separaters each arranged and adapted for the transmission to it of opposition force through engagement between said separater and another said separater for their rightangular displacement relative to their said at least one bottom member panel when said at least one bottom member panel and the bottom member sharing a said diagonal fold together are displaced vertically by their respective side walls of their said similar opposing structure being displaced horizontally and said carrier material enabled to reverse inwardly is displaced inwardly contributing stiffness and positioned for co-operating with the separater forming extensions of the bottom which separate the lower parts of the same said articles carried in the erected collapsible carrier which is erected by moving each said fold for folding fully one toward the other and opened to provide the said displacements.

4,509,641

TWO PART MIXABLE COMPONENT STORAGE CONTAINER FOR WHIPPED CREAM IN FLAVORS AND CORRESPONDING COLORS, AND THE LIKE

Frank Scieri, 85 W. 18th St., Deer Park, N.Y. 11729, and Richard L. Miller, Dix Hills, N.Y., assignors to Frank Scieri, Deer Park, N.Y.

Filed Nov. 19, 1982, Ser. No. 443,048

Int. Cl.³ B65D *25/08, 83/14*

U.S. Cl. 206—219 **3 Claims**

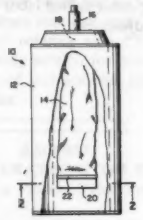
1. A container for storing a first and second mixable component prior to the opening and allowing for mixing subsequent to opening, in combination comprising:

(a) an inverted hollow frustum having a first concentric groove disposed on its base;

(b) a removable hollow cylinder having a first end removably attached to said first concentric groove and being coaxial with said inverted hollow frustum, so that said first mixable component is stored within the confines of said hollow cylinder and said second mixable component is stored within the "ring" shaped area defined by said inverted hollow frustum and said hollow cylinder;

(c) a removable lid for placement on said inverted hollow frustum, having a second concentric groove disposed on its interior so that said lid, when placed on said inverted hollow frustum, will be in alignment for a second end of said hollow cylinder to be removably attached to said second concentric groove; and

(d) a lanyard having a first fixed end to an underside of said lid and a second end fixed to an upper end of said hollow cylinder and being wound at least one turn around the



lower hollow cylinder intermediate said first and second ends so that, upon removal of said lid, said turns of lanyard will ride up said hollow cylinder, causing said second mixable component to separate from the perimeter of said hollow cylinder and ultimately after said turns slide off the top of said hollow cylinder removes said removable hollow cylinder causing said first and second mixable component to come into direct contact for mixing.

4,509,642

CONTAINERS OF FLEXIBLE MATERIAL

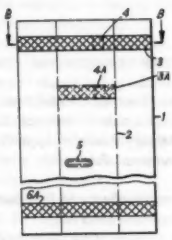
Frank J. Rowell, Fishponds Farm, Brook, Near Ashford, Kent, England

Division of Ser. No. 309,746, Oct. 8, 1981,. This application Apr. 24, 1984, Ser. No. 603,428

Claims priority, application United Kingdom, Oct. 14, 1980, 8033091; Jul. 31, 1981, 8123457

Int. Cl.³ B65D *25/0*

U.S. Cl. 206—219 **4 Claims**



4. A device comprising a container through which extends a tube of flexible material, an opening being provided in the container through which access can be gained to the interior of the tube and container characterized by:

(a) the container (1) being an outer (first) tube of flexible sheet material,

(b) an inner (second) tube (2) extending through the top and bottom of the outer tube,

(c) the inner and outer tubes being sealed together at the top and bottom by first and second seals (3,6A) extending across the tubes,

(d) a third seal (3A) being provided partly across the inner tube between the top and bottom seals,

(e) an opening (4) being provided through the top seal leading to the interior of the inner tube,

(f) a third tube (B2 FIG. 5) within the first tube and around the second tube, and

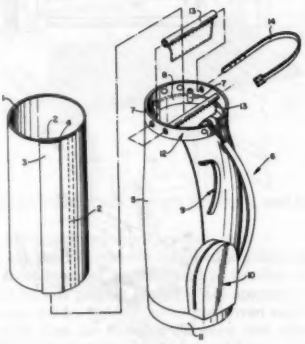
(g) a fourth seal (D) extending across the second tube and partly across the third tube between the ends of the second tube to form two parts of the third tube in communication with each other, an opening being provided through the fourth seal (D) within the region of the second tube, said first and second tubes containing substances to be mixed together.

4,509,643

GOLF BAG WITH A REINFORCING INSERT TUBE

Yong S. Rhee, 251-1 Soo Yoo 2nd-Dong, Dohbong-ku, Seoul, Rep. of Korea (132)

Filed Sep. 15, 1983, Ser. No. 532,523
Claims priority, application Rep. of Korea, Sep. 15, 1982, 7279
Int. Cl.³ A63B *55/00*
U.S. Cl. 206—315.8 **5 Claims**



1. A golf bag, comprising in combination:

a flexible cylinder having a bottom end and a top end;

a lower base portion fixedly connected to said bottom end of said flexible cylinder;

a rigid annular member fixedly connected to said top end of said flexible cylinder; said rigid annular member having an upper free end and a lower end;

said lower end of said rigid annular member having an inner flap and an outer portion having an inner layer; said outer portion being fixedly connected to said top end of said flexible cylinder such that said flexible cylinder is generally continuous with said rigid annular member along respective peripheries thereof so that said rigid annular member forms an opening into said flexible cylinder;

said inner flap of said rigid annular member being annular and having an upper fixed portion and a lower free portion; said upper fixed portion of said inner flap being fixedly connected to said inner layer of said outer portion of said rigid annular member at a location intermediate a lower end and an upper end of said inner layer, such that a receiving portion exists between said inner layer and said inner flap of said rigid annular member; said receiving portion being adapted to receive an edge of a curved sheet;

an assembleable insert cylinder including a resiliently bendable sheet; said resiliently bendable sheet having generally a rectangular perimeter and further having an elongated, resiliently bendable member fixedly connected thereto generally parallel to an edge of said resiliently bendable sheet at a location spaced a predetermined distance from said edge of said resiliently bendable sheet; said elongated, resiliently bendable member having an extension portion which extends generally parallel to said resiliently bendable sheet toward said edge of said resiliently bendable sheet; said extension portion and said edge being adapted to receive an opposing edge of said resiliently bendable sheet therebetween;

in assembled condition, with said opposing edge of said resiliently bendable sheet inserted between said extension portion and said edge to form a cylinder, said assembleable insert cylinder being insertable into said flexible cylinder through said rigid annular member, said assembleable insert cylinder having a length sufficient to contact both said lower base portion of said flexible cylinder and a portion of said inner flap when said flexible cylinder is fully extended about said assembleable insert cylinder; said inner flap being sufficiently flexible to be moved away from said inner layer of said outer portion so as to receive an uppermost edge of said assembleable insert cylinder;

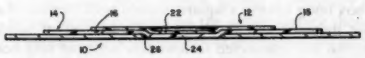
whereby said assembleable insert cylinder is retained within said flexible cylinder by said inner layer of said flexible cylinder.

4,509,644

WATCH CRYSTAL COVER AND PACKAGE ASSEMBLY

John M. Kulick, 50 E. Hill Rd., Canton, Conn. 06019

Filed Jun. 16, 1983, Ser. No. 504,791
Int. Cl.³ B65D *65/40*
U.S. Cl. 206—461 **8 Claims**



1. A watch crystal protective cover assembly, comprising:

a backing board;

a crystal cover member fabricated from a deformable sheet or film of clear synthetic resinous material, said cover member having formed therein a depressed portion dimensioned and configured to protectively overlie a watch crystal;

an insert piece interposed between said cover member and said backing board, said insert piece being dimensioned and configured to lie inwardly of first marginal portions of said cover member, and also to provide a tab portion extending outwardly of a second marginal portion thereof, said insert piece extending beneath said depressed portion of said cover member and having formed therein a similarly depressed portion conforming thereto, said depressed portion of said cover member being nested within said depressed portion of said insert piece, or vice versa;

and an adhesive surface layer bonding said cover member in substantially full surface contact to said backing board and said insert piece, said first marginal portions of said cover member being bonded by said adhesive layer to said backing board, and said tab portion of said insert piece providing means for lifting, and effecting the removal of, said cover member.

8. In a method for protecting a watch crystal, the steps comprising: providing a cover member by forming into a deformable sheet or film of clear synthetic resinous material and depressed portion dimensioned and configured to protectively overlie a watch crystal; providing an adhesive surface layer on said cover member, at least on the convex side of said depressed portion; applying said cover member to the watch crystal with said convex side in registered contact therewith; applying force to the portion of said sheet or film surrounding said depressed portion to displace it downwardly, thereby inverting said depressed portion to render said convex side concave; applying pressure to bring said film or sheet into close conformity and intimate contact with substantially the entire exposed surface of said watch crystal, to adhesively secure it thereto; and excising said inverted depressed portion from the remainder of said cover member to provide said protective cover on said crystal.

4,509,645

PORTABLE CONSTANT TEMPERATURE BOX

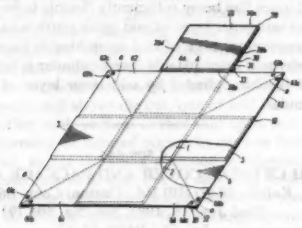
Masashi Hotta, Osaka, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Sep. 14, 1983, Ser. No. 532,169

Claims priority, application Japan, Sep. 22, 1982, 57-143712[U]; Nov. 30, 1982, 57-182134[U]; Dec. 4, 1982, 57-183819[U]

Int. Cl.³ A45C 11/20

U.S. Cl. 206—545 1 Claim



1. A portable constant-temperature box comprising:

(a) a box body having a square bottom wall formed of adiabatic material and four side walls formed of adiabatic material and connected to four side edges of said bottom wall such that said walls can be unfolded and raised,

(b) a lid formed of adiabatic material and supported to at least one of said side walls such that said lid can open and close with respect to said box body;

(c) a square external sheet connecting outer edges of said side walls, respective corners of said external sheet positioned between side edges of adjacent side walls forming connecting portions for connecting adjacent side walls respectively, said connecting portions being foldable triangularly so that first connecting portion free ends thereof folded at said connecting portions between said at least one side wall to which said lid is supported and a pair of side walls adjacent to said at least one side wall overlap second connecting portion free ends which are folded at connecting portions between another side wall opposite to said at least one side wall and a pair of side walls adjacent said another side wall, said first free ends overlapping said second free ends at said pair of side walls which are adjacent said at least one side wall, said first free ends being disposed between said second free ends and said pair of side walls adjacent said at least one side wall such that said first free ends are inside said second free ends in overlapped relationship; and

(d) an elongated fastener comprising a slider and a pair of first and second band members each band member having engaging teeth, said slider being movable to engage and disengage said engaging teeth of said first and second bands with respect to each other to close and release said lid, said first band member being fixed along an entire length of three side edges of said lid, said three side edges each being other than a lid side edge through which said lid is supported to said at least one side wall, said second band member being fixed along an entire length of an upper edge of said another side wall opposite to said at least one side wall, said upper side edge being a highest edge of said another side wall when said another side wall is raised, said second band member also being fixed along an entire length of outer side edges of said connecting portions disposed between said another side wall and said pair of side walls adjacent said another side wall, said outer side edges being outwardly positioned when said connecting portions are folded.

4,509,646

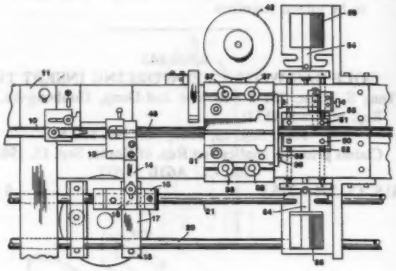
INSPECTION, REJECTION AND SORTING MACHINE

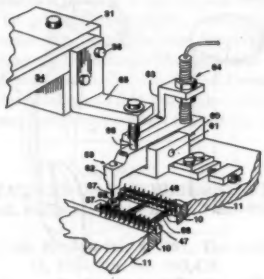
Robert Eitzinger, Deerfield, Ill., assignor to Mid-West Automation Inc., Wheeling, Ill.

Filed Sep. 27, 1982, Ser. No. 424,110

Int. Cl.³ B07C 5/344

U.S. Cl. 209—573 8 Claims





1. An apparatus for inspecting, orienting, and sorting finished work pieces possessing exposed electrical terminals having a designated leading edge, comprising:

(a) an elongated track extending horizontally through the apparatus,

(b) a feed means for moving randomly oriented work pieces into an inspection station of the apparatus,

(c) means for reciprocally moving said feed means relative to said track for feeding finished work pieces into the inspection station of the apparatus,

(d) sets of electrical probes positioned above and below said track and adapted to be moved through a vertical plane into electrical contact with each work piece fed therebetween by said feed means,

(e) means for reciprocally moving said probes toward and away of said track so as to contact both top and bottom terminals of the work piece positioned therebetween on said track,

(f) a work piece rejection means in alignment with said track and adapted to receive inspected work pieces from between said electrical probes,

(g) means for moving said rejection means out of the path of a work piece electrically rejected by said probes for ejecting the work piece from the apparatus,

(h) an orientation probe for the work piece to determine the position of said designated leading edge as it is moved over said track for determining the further path of movement of the work piece into a storage container,

(i) an actuating means connected to one of said electrical probes for movement therewith so as to actuate said orientation probe relative to a work piece as it is positioned on said track, and

(j) a switching track means in alignment with said track and

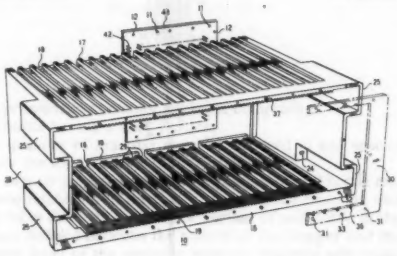
movable between separate storage containers and responsive to said orientation probe for directing all work pieces moving through the apparatus with said designated leading edge in a forward position into one of the storage containers.

4,509,647

UNITARY CONSTRUCTION CIRCUIT PACK CARRIER

George J. Shevchuk, Old Bridge, N.J., assignor to Bell Telephone Laboratories, Inc., Murray Hill, N.J.

Filed Aug. 2, 1982, Ser. No. 404,452
Int. Cl.[3] A47G *19/08*
U.S. Cl. 211—41 16 Claims



1. A carrier molded as a unitary structure, said carrier comprising;

a front member forming an aperture, and

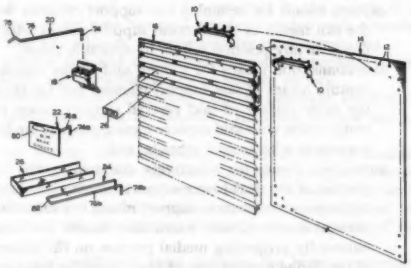
at least one pair of opposing board edge guides integral with said front member and adapted to receive the edges of circuit boards passing through said aperture, said opposing edge guides being cantilevered from said front member such that the distance between said opposing edge guides is substantially greater at said front member than at the free ends of said opposing edge guides.

4,509,648

MERCHANDISING DISPLAY SYSTEM AND COMPONENTS THEREFOR

James A. Govang, Clinton; William W. Mee, New Canaan, both of Conn., and Robert S. de Gruchy, Massapequa, N.Y., assignors to The Stanley Works, New Britain, Conn.

Filed Jul. 26, 1982, Ser. No. 401,970
Int. Cl.[3] A47F *5/08*
U.S. Cl. 211—70.6 21 Claims



1. A merchandise display assembly for use with a perforated member such as perforated panel board and the like comprising:

A. a plurality of panel mounting brackets each having

(i) a body portion providing an upwardly and outwardly inclined ledge and

(ii) a multiplicity of spaced finger portions extending upwardly from said body portion and adapted to engage in the apertures of the associated perforated board;

B. a panel member having

(i) a front face defined by a multiplicity of web portions lying in a common plane and

(ii) vertically spaced track portions extending horizontally therebetween, said track portions providing channels opening at said front face and inclined downwardly therefrom each of said track portions having a bottom wall and a top wall, said track portions being exposed on the rear face of said panel, said inclined ledges of said panel brackets seating the bottom walls of said track portions of said panel member for supporting said panel member on the associated perforated member;

C. a multiplicity of clip members disengageably seated in spaced relationship in said channels of said panel member, said clip members each having

(i) a body portion disposed adjacent a web portion of said panel member,

(ii) a plurality of laterally spaced upper legs inclined downwardly and inwardly from said body portion and extending into a first channel, and

(iii) a lower leg inclined downwardly and inwardly from said body portion and extending into a second channel spaced below said first channel, said legs being configured to seat securely within a vertically spaced pair of said channels, said body portion having a vertically disposed recess therein opening on the upper surface thereof; and

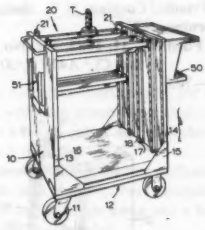
D. a multiplicity of display hooks seated in said clip members and each having at least one arm portion extending away from said panel and a depending leg portion on the inner end of said arm portion seated in one of the recesses in said body portions of said clip members.

4,509,649

CART WITH PLASTIC TOOLHOLDER

Robert J. Evans, Shorewood, Ill., assignor to Aurora Equipment Company, Aurora, Ill.

Filed Aug. 18, 1982, Ser. No. 408,141
Int. Cl.[3] A47F *7/00*
U.S. Cl. 211—70.6 17 Claims



1. In a portable cart mounted on wheels and having a frame with spaced upright walls mounted thereon, portable trays mounted between the spaced upright walls and means securing the trays in detachable assembly with the spaced upright walls, the improvement of a series of toolholders in mounted assembly on said portable trays, each of said toolholders having a central tubular section for receiving an elongated tool in mounted assembly therein, the toolholder having one of its sides provided with a recessed area, a wedge block mounted in said recessed area between the toolholder and the tray, the wedge block and the recessed area having inclined matching engaged surfaces slidable relative to one another, and a thumb screw mounted on said toolholder and extended through and engaged in threaded assembly with said wedge block such that rotation of said thumb screw causes relative movement between said inclined matching engaged surfaces to firmly

wedge the wedge block and toolholder and tray in snug fixed assembly together, and rotation of the thumb screw in an opposite direction causes relative movement between said inclined surfaces to release the toolholder from the tray.

4,509,650

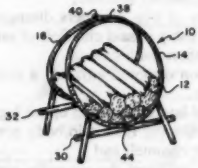
COMBINED FIREWOOD RACK AND FUMIGATOR

Robert Wilgosz, 1000 Crestmont Ave., Mantua, N.J. 08051

Filed May 11, 1983, Ser. No. 493,623

Int. Cl.³ A47F 5/00

U.S. Cl. 211—60.1 **20 Claims**



1. A combined firewood rack and fumigator comprising:

a firewood support frame including at least one tubular member having an upper surface onto which may be placed a plurality of pieces of firewood for supporting the same;

means associated with said frame for supporting said frame on the ground;

said tubular member having a plurality of non-obstructed holes in the tubular wall thereof providing communication between the interior of said tubular member and the exterior thereof;

said tubular member also including a portion thereof extending vertically upwardly;

a fill opening in said tubular member adjacent the top of said vertical portion into which may be poured a fumigant while firewood is supported on said upper surface, and

closure means for closing said fill opening.

4,509,651

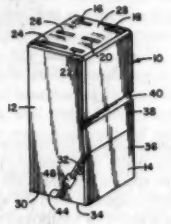
VERSATILE KNIFE HOLDER

William A. Prindle, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Jul. 11, 1983, Ser. No. 512,458

Int. Cl.³ A47F 7/00

U.S. Cl. 211—70.6 **11 Claims**



1. A cutlery holder for positionably retaining a plurality of cutlery items in either an upright orientation or in an inclined orientation, which comprises, a body portion having a plurality of slots formed therein for receiving blade portions of cutlery items, selectively positionable wedge means forming a complementary portion of said body portion, and means for removably retaining said wedge means in alternate positions on said body portion and for positioning said cutlery holder in either a stable upright orientation or an inclined orientation, as desired.

4,509,652

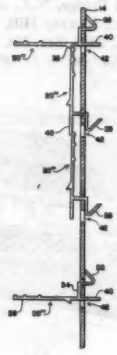
BAKER'S RACK

Neil E. Arney, 6474 Camelia Dr., San Jose, Calif. 95120

Filed Feb. 8, 1983, Ser. No. 464,955

Int. Cl.³ A47F 3/14

U.S. Cl. 211—126 **5 Claims**



1. A rack comprising:

first and second pairs of vertical support means;

interconnection means for selectively spacing apart said first and second pairs of vertical support means one from the other and for selectively spacing apart each vertical support means within each pair of said vertical support means one from the other with said first pair of vertical supports being opposite and aligned with said second pair of vertical supports;

each of said vertical support means defining a multiplicity of slot means therewithin in the surface of said vertical support means facing the opposite vertical support means in the other pair thereof; and

a multiplicity of support members rotationally mountable within the slot means of, and extendable between, the pair of vertical support means of either of said first and second pair of vertical support means;

each of said support members includes:

a support flange portion;

capture means for retaining the support member within the slot means of the vertical support means with said flange in any position within its rotatable range;

interconnection means for joining said flange means and capture means of said support member and for abutting the outer surface of said vertical support means to, in conjunction with said capture means, support the flange portion in a horizontal attitude; and

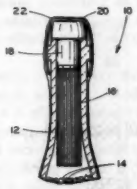
interaction means for selectively maintaining the flange portion of the next lower support member mounted on the same pair of vertical support means in a substantially vertical position, said interaction means includes an outwardly projecting medial portion on the underside of the flange portion spaced apart from the intersection of said flange means with the interconnection means a distance at least equal to the thickness of the flange to selectively interact with the free end of the flange of the lower adjacent support member to maintain same in the vertical attitude while the flange portion of the upper adjacent support member remains in a horizontal attitude.

4,509,653

FOOD CONTAINER

Warren J. Corbett, 2719 120th Avenue NE., Bellevue, Wash. 98005

Filed Apr. 19, 1984, Ser. No. 602,135
Int. Cl.³ B65D *47/32*
U.S. Cl. 215—231 3 Claims



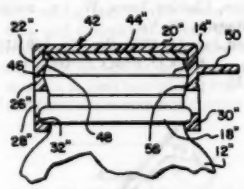
1. A pressurized container package, comprising:
(a) a bottle having a neck portion;
(b) a quantity of granular material disposed in and spaced from the top of said bottle;
(c) a stopper disposed in the neck portion of said bottle and space relationed to the top of said granular material; and
(d) a valve disposed in the neck portion of said bottle in the space defined between the bottom of the stopper and the upper level of the granular material whereby said valve prevents the expulsion of said granular material when the stopper is removed from the pressurized bottle.

4,509,654

TAMPERPROOF CLOSURE

Daniel J. Maguire, P.O. Box 113, Flourtown, Pa. 19031

Division of Ser. No. 478,209, Mar. 24, 1983,. This application Jul. 20, 1984, Ser. No. 632,954
Int. Cl.³ B65D *41/48*
U.S. Cl. 215—253 7 Claims



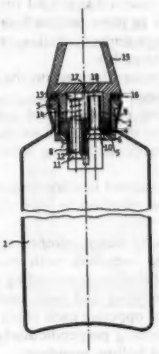
1. A tamperproof closure for securing to the nozzle of a container of the type having a nozzle provided with a medial snap ring and a lower, circular transfer bead comprising
a circular top and cylindrical sidewalls depending therefrom, the sidewalls having an interior surface;
a bottom extension extending from the sidewalls, the bottom extension having an exterior cylindrical surface and an interior surface,
the bottom extension being provided with an internal circular groove, the outer diameter of the groove being less than the outer diameter of the nozzle transfer bead,
the groove of the bottom extension being adapted for frictional engagement over the transfer bead of the nozzle;
a circular weakened seam defining the bottom extension from the said cylindrical sidewalls; and
a snap groove formed in the interior of the closure, the snap groove being formed partially in the interior surface of the sidewalls and in the interior surface of the bottom extension, the snap groove of the closure being adapted for engagement upon the snap ring of the nozzle,
whereby the strength of the frictional engagement between the closure circular groove and the nozzle transfer bead is greater than the strength of the closure at the said weakened seam so that when the closure is to be removed from the nozzle for container opening purposes, the closure will separate along the weakened seam and the bottom extension will remain affixed to the transfer bead of the nozzle.

4,509,655

BOTTLE OR SIMILAR CONTAINER, ESPECIALLY FOR READILY COMBUSTIBLE LIQUIDS, WITH A SCREW-ON CLOSURE

Peter A. Killmann, Essen, Fed. Rep. of Germany, assignor to Marsteller & Killman GmbH & Co. KG, Essen, Fed. Rep. of Germany

Filed Oct. 27, 1983, Ser. No. 545,962
Claims priority, application Fed. Rep. of Germany, Jul. 5, 1983, 3324097
Int. Cl.³ B65D *47/14*
U.S. Cl. 215—309 6 Claims



1. Bottle or similar container, particularly for readily combustible liquids, with a closure comprising: two openings that can be closed off, one a liquid outlet and the other an air inlet, said container having a neck;
(a) an insert in the neck of the container with said two openings therethrough, said openings being parallel, one opening being a liquid outlet for pouring out a liquid and the other opening being an air inlet;
(b) a tubular projection that is oriented outward for extending said liquid outlet;
(c) two separate plugs for closing each opening from inside the container, one plug being rigidly attached to the other;
(d) a bolt rigidly attached to the plug associated with said air inlet, said bolt passing through said air inlet with a predetermined amount of play; spring means on said bolt for forcing both plugs against said openings;
(e) said bolt having a free end projecting out of said air inlet for functioning as a button that can be activated to open valves comprised by said openings and plugs;
(f) a stopper screwed into the neck of the container and having an external annular shoulder resting on the neck;
(g) said stopper having a recess opening toward the inside of the container, said button and said tubular projection on said liquid outlet extend into said recess.

4,509,656

VARIABLE LENGTH PACKING CONTAINER ASSEMBLY

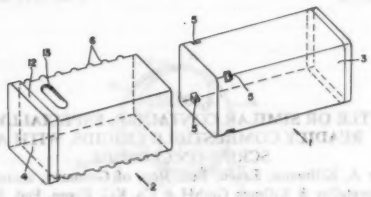
Peter Rösler, Wangen, Fed. Rep. of Germany, assignor to Rose-Plastic GmbH, Hergensweiler, Fed. Rep. of Germany

Filed Sep. 20, 1983, Ser. No. 534,084

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1982, 8226875[U]

Int. Cl.³ B65D *11/02, 85/54*

U.S. Cl. 220—8 **13 Claims**



1. A packing container assembly particularly for storing elongated objects comprising:

an inner and an outer elongated hollow member each having a polygonal cross-sectional configuration with a closed end and an open end, said open end of said inner hollow member being inserted into said open end of said outer hollow member to place said hollow members in longitudinal sliding engagement relative to each other to form said container assembly;

first interlocking means formed on the outer surface of said inner hollow member;

second interlocking means formed onfhe inner surface of said outer hollow member, said second interlocking means comprising inwardly projecting webs formed in said outer hollow member;

said first and said second interlocking means cooperating to hold said hollow members in fixed engagement with each other;

said first interlocking means comprising a plurality of longitudinally spaced members with each of said members comprising protuberances extending outwardly from said inner hollow member and with said members being located diagonally opposite each other and lying in a common plane extending perpendicularly to the longitudinal direction of said hollow members;

the polygonal cross-sectional configuration of each of said hollow members being formed with interfitting corners, with the corners of said inner hollow member being formed with an outer radius of curvature which is greater than the inner radius of curvature of said corners of said outer hollow member;

each of said inner and outer hollow members being formed as a solid, one-piece member of relatively stiff material.

4,509,657

INSULATION EMBODIMENT IN A WEDGE-SHAPED SPACE BETWEEN TWO STRUCTURAL MEMBERS

Svein Grondalen, Moss, Norway, assignor to Moss Rosenberg Verft A/S, Moss, Norway

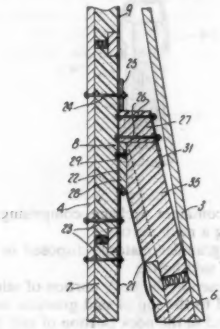
Filed Sep. 23, 1982, Ser. No. 422,365

Claims priority, application Norway, Nov. 4, 1981, 813731

Int. Cl.³ B63B *25/08, 25/16;* **B65D** *8/06*

U.S. Cl. 220—436 **8 Claims**

1. An insulated spherical tank system for containing liquefied gas comprising, a spherical tank for containing liquefied gas, an annular support ring for the tank joined to the periphery of the tank at a point of juncture for supporting the tank on a support structure, said support ring having an inner surface facing the tank, and said tank having an outer surface facing the inner surface of the ring, said tank and ring defining a generally wedge shaped space therebetween below said point of juncture thereof, a first insultation layer secured to said inner surface of said ring and a second insulation layer surrounding and adjacent to said outer surface of the tank, said first and second insulation layers extending into said wedge shaped space, and nonadhesive mechanical means for joining said insulation layers together in said wedge shaped space; said nonadhesive mechanical joining means including means secured to said ring and defining a generally wedge shaped receiving pocket opening outwardly away from said point of juncture between the ring and tank, said second insulation layer having an upper and received in said pocket, said means defining said generally wedged shaped pocket including means for mechanically clamping said upper end of the second insulation layer in said pocket.



4,509,658

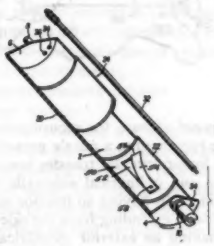
ANTI-THEFT DEVICE FOR TANDEM COLUMN VENDOR

Kenneth W. Oden, Charles Town, W. Va., assignor to Dixie-Narco, Inc., Ranson, W. Va.

Filed Jan. 11, 1984, Ser. No. 569,910

Int. Cl.³ B59Q *59/00*

U.S. Cl. 221—115 **17 Claims**



1. In a vending machine:

means defining a compartment adapted to hold front and rear columns of cylindrical articles of predetermined diameter;

a dispensing cradle in the lower end portion of said compartment and comprising a hollow, open-sided, generally semi-cylindrical cradle extending from front to rear of said compartment and mounted for angular movement about its own longitudinal axis, said axis extending from front to rear of said compartment;

said cradle internally having wall means defining a floor provided with a front site constructed and arranged to receive through the open side of the cradle and to support a front cylindrical article from a front column of cylindri-

cal articles when such a column is held in said compartment, and with a rear site constructed and arranged to receive through the open side of the cradle and to support a rear cylindrical article from a rear column of cylindrical articles when such a column is held in said compartment the front site axially adjoining the rear site within the cradle;

said cradle wall means providing an axially extending leading edge which, axially coincident with said front site and said rear site is effectively at a common angular disposition;

said cradle wall means providing a stepped axially extending trailing edge which, axially coincident with said front site and said rear site is effectively at two substantially different angular dispositions, so that angular rotation of said cradle by a first increment about said axis is sufficient to permit a said cylindrical article if contained in said cradle at said front site to drop therefrom over said trailing edge, but insufficient to permit a said cylindrical article if contained in said cradle at said rear site to drop therefrom until said cradle has been angularly rotated by a second increment about said axis;

said cradle being characterized by being internally free of fixed transverse partitioning between said front site and said rear site, whereby said compartment may selectively contain, and said cradle may hold, a single column of alternate articles which are so much longer than said cylindrical articles that in order to be contained in said cradle, one of them would need to occupy at least parts of both said front site and said rear site;

an anti-theft device comprising:

a raiseable/lowerable barrier disposed within said cradle for preventing when raised a said cylindrical article if contained in said cradle at said rear site at a time when said front site is empty of any said cylindrical article, from being urged axially forwards sufficiently from said rear site towards said front site when said cradle has angularly rotated about said axis only by said first increment as to be able to fall over said trailing edge; and

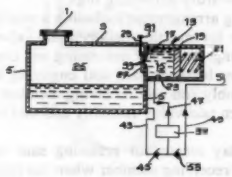
means associated with said barrier and said cradle for effectively raising said barrier when said front site is empty of a said cylindrical article and for permitting said barrier to be effectively lowered out of the way when said front site either contains a said cylindrical article or when at least part of said rear site and at least part of said front site in common contain a said alternate article.

4,509,659

PORTABLE LIQUID MEASURING AND DISPENSING DEVICE

Richard Cloutier, 23 Langevin St., Boisbriand, Quebec, Canada J7E 4H5, and Carlo Vissani, 9885 Larose St., Montreal, Quebec, Canada H2B 2Y7

Filed Sep. 8, 1982, Ser. No. 415,900
Int. Cl.³ B67D *5/30*
U.S. Cl. 222—41 **5 Claims**



1. A portable liquid measuring and dispensing device comprising:

a main reservoir for containing said liquid;

chamber means for metering predetermined quantities of said liquid, said chamber means being solid with said main reservoir and comprising a chamber having visual means capable of indicating the quantity of liquid therein, said chamber also having a liquid aperture, said chamber means further comprising a movable piston closing one end of said chamber and resilient means biassing said piston toward said liquid aperture,

a liquid moving assembly solid with said reservoir and chamber means, said assembly comprising:

a rotary pump;

a D.C. motor connected to said pump for operation thereof in either one of two opposed directions of rotation;

D.C. power source means connected to said motor and including a polarity inverter switch having operating button means actuatable to cause selective rotation of said pump in one of said directions;

a liquid dispenser, and

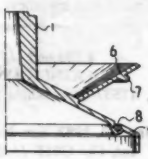
piping means operatively connecting said reservoir pump, chamber, reservoir and dispenser to allow movement of said liquid restritively from said reservoir through said pump to said chamber when the button means are actuated for rotation of the motor in one of said directions and to allow movement of said liquid restrictively from said chamber through said pump to said dispenser when the button means are actuated for rotation of the motor in the other of said directions.

4,509,660

TUBE END PIECE

Antero Makilaakso, Espoo, Finland, assignor to Printal Oy, Helsinki, Finland

Filed Mar. 14, 1983, Ser. No. 475,320
Claims priority, application Finland, Mar. 17, 1982, 820914
Int. Cl.³ B65D *35/10*
U.S. Cl. 222—107 **5 Claims**



1. A tube end piece adapted for convenient joining to a separately manufactured tube mantle, wherein on a conical portion of said end piece a bendable fixing and seaming member is provided flexibly attached thereto in readiness for bending down onto and clamping an end of the tube mantle, said fixing member consisting of an annular bendable extension extending outwardly from said conical portion and which is stable in both an initial upper position and also in a downward clamped position against said end of the tube mantle.

4,509,661

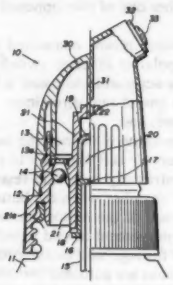
SQUEEZABLE CONTAINER FOR DISPENSING FOAMED SOL

Takashi Sugizaki, Kaizuka, and Yoshisuke Sakamoto, Osaka, both of Japan, assignors to Toyo Seikan Kaisha, Ltd., Tokyo, Japan

Filed Jun. 22, 1982, Ser. No. 390,868
Claims priority, application Japan, Nov. 24, 1981, 56-186854
Int. Cl.³ B05B *11/04*
U.S. Cl. 222—190 **9 Claims**

1. A squeezable container for dispensing foamed sol which comprises a container body and a nozzle assembly adapted to be connected together by means of threads, said nozzle assembly comprising an internally threaded outer cap member having a plug and a double walled inner cap member including a

threaded outer cylinder for threaded engagement with said container body and said outer cap member, respectively and an inner cylinder surrounded by said outer cylinder in peripherally spaced relationship thereto to define a check valve therebetween, said inner cylinder including a spouting opening to be closed and opened by said plug, an inverted U-shaped flanged pipe joint received in said inner cylinder of the inner cap member and having a communication opening at the top, the flange at the lower end of said pipe joint being positioned below and spaced from the lower end of said inner cylinder of the inner



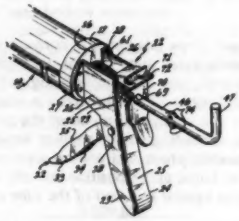
cap member, a flow-out pipe received in said pipe joint and opens at the top and bottom for communication with said communication opening and the interior of said container body, respectively, an inverted cup-shaped porous member positioned on the top of said pipe joint in said inner cylinder of the inner cap member, flow-out passage means extending from the space between said lower end of the inner cylinder and said bottom flange of the pipe joint to a point of the outer surface of said porous member, and an adapter adjustably fitted in the leading end of said outer cap member.

4,509,662

CAULKING GUN

Sherman L. Weiss, 17537 Devonshire St., Northridge, Calif. 91325

Filed Jan. 13, 1983, Ser. No. 457,661
Int. Cl.³ G01F *11/00*
U.S. Cl. 222—391 **1 Claim**



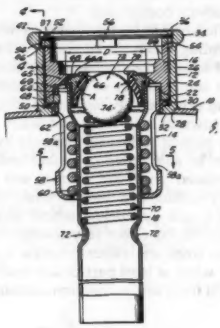
1. In a caulking gun of the type having a cradle in the form of a half cylinder having a rear end part and having a front end member attached to it, adapted to receive a cartridge of caulking material having a piston member in it and having an end dispensing nozzle, the front end member having an opening adapted to receive the nozzle, the gun having a handle member attached to the said rear end, an actuating stem extending through the handle member and through the rear end part and carrying a disk member engageable with the piston member of the cartridge, a trigger member formed of sheet metal and having side walls, a transverse member extending between said side walls, a dog engageable with the stem for reciprocating it positioned to be actuatable by the trigger, the said dog having a part extending between said side walls and engaging said transverse member, a coil spring on said stem normally urging the dog in a rearward direction, an abutment member carried by the said stem in a position to engage a part of the gun to limit forward movement of the stem to prevent the said disk member from driving the cartridge piston against the said front end member in a manner to break the front end member away from the cradle, a latch member carried by the said handle member, the latch member being in the form of a latch dog engageable with the said stem for holding the stem against reverse movement requiring that the latch dog be actuated to release the stem, the said abutment member being positioned on the stem whereby to engage the said latch dog so as to actuate the said latch dog to release the stem so as to release the pressure on the cartridge piston, and to prevent continued forward movement of the stem, the latch dog being mounted for angular movement, the stem extending through an aperture in the latch dog at a position requiring relatively small movement of the latch dog to effect release, the said handle having an extending bracket having a slot in it, the latch dog having a part extending through said slot for mounting it.

4,509,663

LOCKING MECHANISM AND VALVE ASSEMBLY

Merton R. Fallon, Thousand Oaks, Calif., assignor to Draft Systems, Inc., Northridge, Calif.

Filed Mar. 29, 1982, Ser. No. 361,975
Int. Cl.³ B65D *83/00*
U.S. Cl. 222—400.7 **11 Claims**



1. A valve sealing arrangement for sealing a container of fluid comprising:

(a) a valve assembly for providing access to said container;

(b) a valve assembly receiving member secured to said container;

(c) a deformable sealing member;

(d) said valve assembly having a body portion with a seal engaging surface and including a pair of diametrically opposed inwardly extending lugs;

(e) said sealing arrangement including a nonthreaded retaining member for insertion between said valve assembly and said receiving means for deforming and compressing said seal member between said seal engaging surface of said valve assembly and said receiving member for effecting a seal between said valve assembly and said receiving member;

(f) safety delay means for retaining said valve assembly within said receiving member when the container is under pressure should said retaining member become disengaged thereby allowing for gas to be released from the container prior to removal of said valve assembly, said safety delay means comprising:

(i) a pair of diametrically opposed keys carried by said body portion of said valve assembly, said keys being circumferentially spaced 90 degrees from said lugs; and

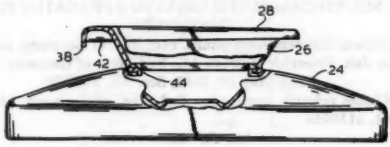
(ii) a pair of diametrically opposed offset keyways formed in said valve assembly receiving member, said keys being adapted to engage said keyways to prevent withdrawal of said valve assembly until rotated to a predetermined position after said retaining member has been withdrawn.

4,509,664

PORTABLE SPRAYER WITH SAFETY COVER

Walter E. Petersen, Hastings, Minn., assignor to H. D. Hudson Manufacturing Company, Chicago, Ill.

Filed Mar. 23, 1983, Ser. No. 478,027
Int. Cl.³ B65D *83/14*
U.S. Cl. 222—402 **4 Claims**



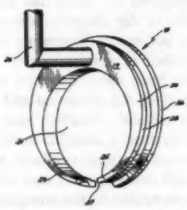
1. A sprayer for dispensing a liquid comprising:
a tank provided for holding said liquid and having a funnel-shaped neck with an upper flange and a circumferential wall extending downwardly from said upper flange, said wall having at least one bottom edge portion formed to gradually rise toward said flange to form a camed surface;
a pump for generating air pressure within said tank;
a closure adapted to hold said pump and to form an air tight seal with said tank while the tank is pressurized by engaging said cammed surface;
means mounted on said neck and adapted to stop said closure from separating from said tank when said closure is removed while the tank is pressurized; and
a nozzle for dischargine said liquid under pressure from said tank.

4,509,665

POURING DEVICE

Donald T. Goodall, 30 Beach St., Blakehurst, N.S.W. 2220, Australia

Continuation of Ser. No. 325,424, Nov. 23, 1981, filed as PCT AU 81/00033, Mar. 23, 1981, published WO 81/02720, Oct. 1, 1981, § 102(e) date abandoned.
This application Feb. 6, 1984, Ser. No. 577,017
Claims priority, application Australia, Mar. 21, 1980, PE2869; Nov. 13, 1980, PE6486
Int. Cl.³ B65D *25/48, 51/16*
U.S. Cl. 222—478 **5 Claims**



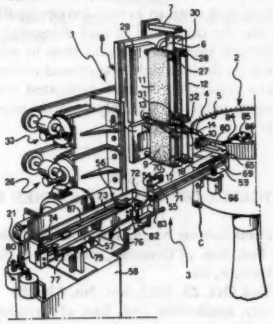
1. A pouring device adapted to be positioned in the outlet of a container, said device comprising:
(i) a body portion having a front face and a rear face arranged so that the rear face is directed towards the interior of the container when the device is in position,
(ii) an aperture through the body portion from the front face to the rear face,
(iii) an air flow tube extending from the rear face of the body portion and in communication with the aperture, the air flow tube having a free end disposed within the container so that air may flow through the tube from the exterior of the container to the interior thereof, said free end being located above the aperture when the container is in the pouring position,
(iv) a pair of opposed legs extending from the body portion which generally conform to the shape of the container outlet but which are spaced apart at their ends remote from the body portion, the area between the legs defining an outlet path through which liquid from the container may flow, the cross-sectional area and the width of the legs progressively increasing lengthwise from their free ends so that when deformed inwardly to fit within the container outlet the bending stresses are evenly distributed therealong to resist creep.

4,509,666

STOCKING TURNING DEVICE

Pietro Rosso, Turin, Italy, assignor to Rosso Industrie S.p.A., Orbassano, Italy

Filed Apr. 11, 1984, Ser. No. 598,942
Claims priority, application Italy, Apr. 11, 1983, 67394 A/83
Int. Cl.³ D05B *21/00*
U.S. Cl. 223—39 **22 Claims**



1. A stocking turning device of the type having a fixed flat bar and members which are resiliently pressed against the opposite faces of the flat bar, said members being arranged to grasp the tubular textile portion of a stocking close to the previously-sewn toe when this toe is held against the free end of the flat bar, and being arranged to fit the tubular textile progressively on to the flat bar, simultaneously turning it inside out, wherein the improvement comprises at least one pair of endless drive belts identical in each pair disposed on opposite side of the said flat bar symmetrically relative thereto, said belts each passing around pulleys rotatable about axes the positions of which are at fixed levels relative to the flat bar and sandwiching the said bar between their passes closely fitting the above mentioned bar.

4,509,667

WRIST OR ARMBAND FOR HOLDING CAMERA

Kent J. Meldrum, 4820 E. Clearwater Pkwy., Paradise Valley, Ariz. 85253

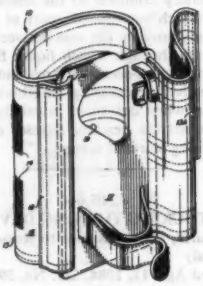
Filed Jan. 23, 1984, Ser. No. 572,817
Int. Cl.³ A45C *11/00*
U.S. Cl. 224—250 **6 Claims**

1. An arm mountable camera support comprising:
a thin plate for supporting a camera,
an elongated strap for looping at least partially around the arm of a user,

said plate having a pair of slots extending longitudinally thereof one along each side thereof, and an aperture at one end thereof for receiving the camera film sequencing means therein,

one end of said strap extends through one of said slots and is folded back on and secured to itself,

a pair of camera holding straps one attached to each end of said plate for securing each end of a camera positioned on said plate, and



at least one strip of a Velcro connector mounted on a surface of said elongated strap to extend longitudinally thereof,

whereby when the other end of said elongated strap is extended through said other of said slots in said plate and folded back on itself to tightly surround an arm of a user, said Velcro connector on said elongated strap engages itself along its length to securely hold the support on the arm of the user.

4,509,668

PNEUMATICALLY OPERABLE FASTENER DRIVING TOOL

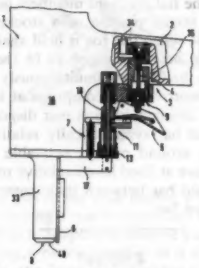
Artur Klaus, Frankfurt am Main, and Hans Wilhelm, Bad Vilbel, both of Fed. Rep. of Germany, assignors to Signode Corporation, Glenview, Ill.

Filed Oct. 25, 1982, Ser. No. 436,485

Claims priority, application Fed. Rep. of Germany, Oct. 24, 1981, 3142237

Int. Cl.³ B25L *1/04*

U.S. Cl. 227—8 **9 Claims**



1. A pneumatic fastener driving tool including a housing for high-pressure air, a cylinder in said housing, a driving piston in said cylinder and having a driver secured to said driving piston, which driver is guided in an output barrel, the improvement comprising a mechanism for controlling the operation of said tool to drive a fastener, said mechanism including a first valve means for controlling the flow of high-pressure air relative to said driving piston, a control assembly for controlling the operation of said first valve means, and a safety mechanism for controlling the operation of said control assembly, which safety mechanism regulates the operation of said first valve means to effect driving of a fastener when the output barrel is in engagement with a workpiece, and means for normally retaining the safety mechanism in an inoperative position when the tool is not being operated.

4,509,669

SOUND-DAMPENED DRIVING APPARATUS FOR FASTENERS

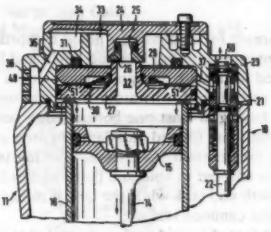
Wolfgang Elliesen, Ahrensburg, Fed. Rep. of Germany, assignor to Joh. Friedrich Behrens AG, Fed. Rep. of Germany

Filed May 19, 1982, Ser. No. 379,970

Claims priority, application Fed. Rep. of Germany, May 20, 1981, 3119956

Int. Cl.³ B25C *1/04*

U.S. Cl. 227—130 **5 Claims**



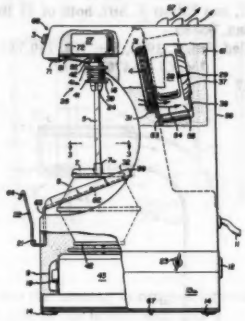
1. A sound and recall-dampened driving apparatus for fasteners, which apparatus includes a housing defining a main working piston cylinder and a cylindrical housing bore thereabove and a main valve means positioned in said cylindrical housing bore above the working piston cylinder and defining a chamber between the valve means and the end of the housing bore, which valve means includes a valve member movable from a lower position, wherein the valve member separates the working piston cylinder from a source of compressed air and connects the cylinder with the atmosphere, to an upper position, wherein the valve member connects the working piston cylinder to the source of compressed air while blocking the connection of the cylinder with the atmosphere, and in which the chamber defined above the main valve member and the end of said cylindrical housing bore is alternately connected to the atmosphere or compressed air, and sound and recoil-dampening means positioned in the chamber above the main valve member, said sound and recoil-dampening means including a delaying disc positioned in and supported for limited axial movement above the main valve member, said delaying disc having a central opening for receiving and guiding an axial flange of the valve member, wherein said delaying disc is formed of a relatively heavy metallic material whereas said valve member is formed of a light synthetic material, a further chamber between said delaying disc and said valve member being alternatively connected to the atmosphere and a source of compressed air, and a resiliently elastic dampening material positioned between said delaying disc and the end of said cylindrical housing bore to bias said delaying disc away from said end of said cylindrical housing bore when said further chamber between said delaying disc and said valve member is connected to compressed air to press said delaying disc against said resiliently elastic dampening material.

4,509,670

SOLDERING STATION WITH AUTOMATIC DROSS REMOVAL

Edward Cammarata, 517 SW. 73rd Ave., North Lauderdale, Fla. 33068

Filed Apr. 14, 1983, Ser. No. 484,973
Int. Cl.³ B23K 1/00
U.S. Cl. 228—34 15 Claims



1. A solder station for production dipping of small parts in molten solder metal, comprising in combination:

a solder pot with heating element containing solder metal;

automatic dross skimmer means;

dross collection tray means; and power for said solder pot and for said automatic dross skimmer means;

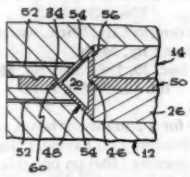
said dross collection tray means comprises a downward sloping dross tray main panel having a generally centrally located opening that admits the upper part of said solder pot, said dross tray main panel having an upper rear edge and two side edges, said edges having vertical flanges, and a lower front edge, said front edge extending generally vertically downward as a vertical extension, a forward facing generally vertical front panel, said vertical extension and said front panel mutually attached at their lower edges and forming a dross trough, said dross trough open at at least one of the sides.

4,509,671

METHOD OF PRODUCING DIFFUSION BONDED SUPERPLASTICALLY FORMED STRUCTURES

Edward D. Weisert, San Carlos, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jul. 25, 1983, Ser. No. 517,153
Int. Cl.³ B23K 31/02
U.S. Cl. 228—157 29 Claims



1. A process for producing metallic structures of predetermined shape from at least two metal workpieces capable of diffusion bonding and superplastic forming which comprises:

inserting at least two of said metal workpieces in contact with each other in a tooling apparatus,

providing a cavity in said tooling apparatus on opposite sides of said workpieces along a preselected area thereof,

diffusion bonding said workpieces at certain contacting areas thereof while leaving the preselected area adjacent to said cavity unbonded, and

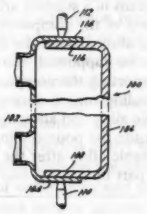
expanding said unbonded areas of said workpieces by superplastic forming to force the unbonded portions of said at least two workpieces into contact with the walls of said cavity and forming a hollow, peripheral cross-sectional shape on said diffusion bonded workpieces.

4,509,672

METHOD OF CONSTRUCTING HEADERS OF HEAT EXCHANGERS

Ivan D. Woodhull, Jr., Flat Rock, and Thomas H. Liedel, Maybee, both of Mich., assignors to Karmazin Products Corporation, Wyandotte, Mich.

Division of Ser. No. 250,541, Apr. 3, 1981, Pat. No. 4,381,033, which is a continuation of Ser. No. 884,368, Mar. 7, 1978, abandoned, which is a continuation-in-part of Ser. No. 789,411, Apr. 21, 1977, abandoned. This application Feb. 8, 1983, Ser. No. 464,985
Int. Cl.³ B23P 15/26; B23K 28/02
U.S. Cl. 228—175 4 Claims



1. A method of constructing a header for a heat exchanger of the fin and tube type comprising:

assembling a base member to a fin and tube core having said base member a plurality of tapered tubular projections extending outwardly from one side, respective of said tubular projections being telescopically mated with respective ones of said tubes, said base member further having a first and second spaced flange portions extending outwardly in an opposite direction from said tubular projections;

assembling a cover member to said base member, said cover member having first and second spaced flange portions which are positioned in closely adjacent overlapping relationship with said first and second flange portions of said base member to thereby define an enclosed space simultaneously securing said first flange portions together and said second flange portions together at a plurality of spaced apart locations, from outside said closed space, said locations being spaced from the edges of said flange portions;

placing a quantity of brazing material within said header adjacent at least one of said overlapping first flange portions and said overlapping second flange portions; and

passing said header through a brazing furnace so as to cause said brazing material to flow between and seal said overlapping first flange portions and said overlapping second flange portions together.

4,509,673

PROCESS FOR CREATING A SUPPORT MEANS FOR A COMPONENT PART TO BE REWORKED AND/OR REPAIRED AND A WELDING DEVICE OBTAINED ACCORDING TO SAID PROCESS

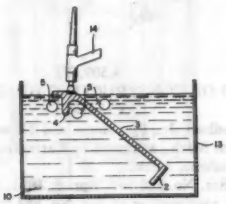
Werner Schmidt, Niederroth, and Franz Jahn, Sigmertshausen, both of Fed. Rep. of Germany, assignors to Motoren-und Turbinen-Union Munchen GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 26, 1983, Ser. No. 461,015

Claims priority, application Fed. Rep. of Germany, Feb. 5, 1982, 3203868

Int. Cl.³ B23K *37/04, 37/00*

U.S. Cl. 228—212 **14 Claims**



1. A process for creating a support means, for welding treatment of a component part to be reworked and/or repaired, the component part having areas to be supported during welding treatment, comprising the steps of

placing cooling means in a support area to be cooled during welding treatment of the component,

pouring a meltable alloy around the surfaces of the component that are to be supported, the meltable alloy in the cooled state supporting the component,

embedding the cooling means during the pouring process with the meltable alloy and allowng access to the cooling means from outside the poured alloy, and

removing the meltable alloy after the welding treatment of the component part by heating said meltable alloy.

4,509,674

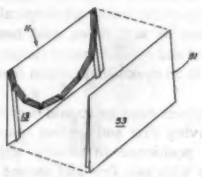
PITA BREAD SANDWICH HOLDER

Lois B. Levick, 32 Savoy Rd., Framingham, Mass. 01701

Filed Apr. 18, 1983, Ser. No. 486,259

Int. Cl.³ B65D *5/32*

U.S. Cl. 229—23 R **10 Claims**



1. A blank for use in the construction of a holder for supporting a pita bread sandwich in an upright position on a table top comprising a sheet of foldable material cut and scored to define:

a. a lower panel having an upper edge, a bottom edge and a pair of side edges,

b. a pair of side sections panels hingedly connected to the side edges of the lower panel, one on each side thereof,

c. a pair of glue flaps hingedly connected to the outer side edges of the side section panels, one on each side thereof,

d. an upper panel hingedly connected to the top edge of the lower panel, and

e. a plurality of glue tabs hingedly connected to the upper panel,

f. said upper panel being of semicircular configuration and having a straight bottom edge and an arcuate top edge.

4,509,675

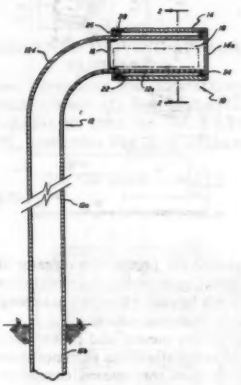
MAIL BOX

Bradford E. Siff, and Elliott J. Siff, both of 15 Broadview Rd., Westport, Conn. 06880

Filed Feb. 8, 1980, Ser. No. 119,742

Int. Cl.³ A47G *29/12*

U.S. Cl. 232—17 **10 Claims**



1. A roadside mail receptacle of the rural delivery type, comprising:

a hollow member of L-shaped configuration, at least the horizontal leg of the L-shape being of substantially circular cross-section;

a transverse partition in said horizontal leg remote from the free end thereof and defining therein a mail compartment;

means defining an opening in the horizontal leg for the insertion and removal of mail into and from said compartment; and

a cylindrical closure sleeve, closed at one end, coaxially rotatably disposed on said horizontal leg and having a sidewall opening adapted, in one rotational position of the sleeve, to register with the opening in said horizontal leg.

4,509,676

ROTARY POST OFFICE BOX AND EQUIPMENT ENCLOSURE

George F. Stacy, Traverse City, Mich., assignor to HSS Industries, Inc., Traverse City, Mich.

Filed Dec. 20, 1983, Ser. No. 563,674

Int. Cl.³ B65D *91/00*

U.S. Cl. 232—43.4 **9 Claims**

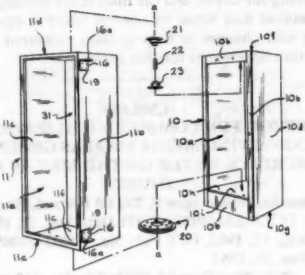
1. An enclosure for a plurality of boxes which comprises:

(a) an enclosed housing (**10**) having a single first vertically oriented first opening (**10*a***) on one side (**10*b***);

(b) a holder unit (**11**) having a vertically oriented second opening (**11*a***) mounted within the housing so as to be rotatable on a vertical axis (a—a) in the housing to align the second opening on a first side of the holder unit adjacent the first opening in the housing, wherein the boxes are (**12**) mounted in the holder unit and are accessible by a user in a first position when the first and second openings are aligned, and wherein the holder unit is rotated in the housing to provide access to a back side of the boxes in a second position;

(c) locking means (**13, 14, 15, 16, 17, 18, 19**) acting between

the housing and the holder unit which when locked prevents the rotation of the holder unit in the housing so that the second opening can be aligned and locked in position adjacent the first opening in the housing and so that when the locking means is unlocked, the second opening can be



rotated into the housing in order to provide the access to the back side of the holder unit; and

(d) a covering on the holder unit over the back side of the holder unit with a lock which can be opened to provide access to the boxes in the second position through the first opening of the enclosed housing.

4,509,677

MIXING VALVE

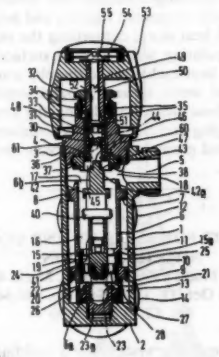
Brian Bendall, Nr. Newport, and Stephen W. Flannery, Wolverhampton, both of England, assignors to Meynell Valves Limited, Wolverhampton, England

Filed Sep. 24, 1982, Ser. No. 422,948

Claims priority, application United Kingdom, May 26, 1982, 8215409

Int. Cl.³ G05D *23/13*

U.S. Cl. 236—122 **4 Claims**



1. A valve for controlling the mixing of hot and cold water comprising:

a hollow body having two ends and being closed at one end;

a sleeve having top and bottom ends and located concentrically of said hollow body, one end making fluid tight engagement with the said closed end of said body;

a first annular flange member spaced from said closed end of said body and extending between said sleeve and the walls of said body to define a first chamber between said flange and said closed end of said body;

a second annular flange member adjacent the top end of said sleeve and extending between said sleeve and said walls to define a second chamber therebetween;

a hot water inlet communicating with said first chamber;

a cold water inlet communicating with said second chamber;

a third annular flange member extending inwardly of said sleeve to define a mixing chamber in the portion of said sleeve remote from said closed end of said body,

a face of said flange facing said closed end forming a first valve seat;

said first chamber communicating with the inside of said sleeve via radially directed hot water passageways formed through said sleeve adjacent the closed end of said body,

said second chamber communicating with the insides of said sleeve via radially directed cold water passageways formed through said sleeve, and adjacent said third annular flange member;

a piston member slidably located within said sleeve for movement between,

a first position where it seats against said first valve seat and closes said cold water passageways and permits water to flow through said hot water passageways and a second position where it seats against a second valve seat located at said closed end of said body and closes said hot water passageways and permits water to flow through said cold water passageways, said piston including axially directed passageways to permit hot water to flow therethrough and into said mixing chamber, when said piston is in said first position;

spring means located between said closed end of said body and the piston urging said piston into said first position;

a tap head closing the other end of said body and including a mixed fluid outlet communicating with said mixing chamber through a shut-off valve member capable of axial movement within said body between an open position wherein water is permitted to flow from said mixing chamber through said mixed outlet and a closed position wherein said member seats on the outer end of said sleeve to prevent flow of water from said mixing chamber;

an externally threaded hollow spindle located in a correspondingly screw-threaded axial passageway extending through said tap head and having one end fixedly attached to said shut-off valve member;

a flow control member non-rotatably attached to the other end of said spindle;

a temperature responsive device located in said mixing chamber between one element abutting said piston, and another element extending into said hollow spindle;

a second compression spring member being located within said hollow spindle between the top of said other element and an axially adjustable temperature control member screw-threadedly located within said hollow spindle, said second spring having a greater compression strength than said first spring,

whereby expansion of the temperature responsive device in response to an increase in water temperature in said mixing chamber, initially urges said other element and said second spring upwardly into said hollow spindle until said second spring abutts the temperature control member, and thereafter urges said first mentioned element against the said piston to move said piston against said first compression spring to seat against said hot water seat and close said hot water passageways, further expansion of the temperature responsive device then compressing said second spring;

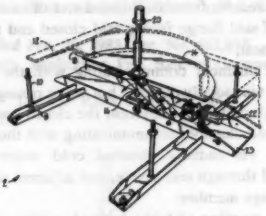
wherein the movement of the piston between its first and second positions is in the range of about 0.4–0.6 mm.

4,509,678

THERMALLY-POWERED CONTROL MECHANISM

Robert W. Noll, 800 Wikiup Rd., Santa Rosa, Calif. 95401

Filed Feb. 1, 1984, Ser. No. 576,067
Int. Cl.³ F24F 7/00
U.S. Cl. 236—49 **3 Claims**



1. A thermally powered control mechanism for an air diffuser for discharging supply air into a room comprising:

output means for varying the size of the air diffuser discharge opening;

means for sensing the temperature of the room air;

means for sensing the temperature of the supply air;

linkage operatively connecting said room air temperature sensing means and said supply air temperature sensing means to said output means so that when the supply air temperature is cool, said room air temperature sensing means operates to decrease the size of said discharge opening when the room temperature cools, and to increase the size of said discharge opening when the room temperature warms; and

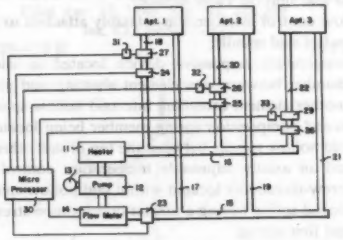
when the supply air temperature is warm, said supply air temperature sensing means operates to disengage said room air temperature sensing means and to increase the size of said discharge opening.

4,509,679

ENERGY USE MONITORING SYSTEM

Richard L. Longini, 6731 Forest Glen Rd., Pittsburgh, Pa. 15217

Filed May 16, 1983, Ser. No. 494,715
Int. Cl.³ G05D 23/00
U.S. Cl. 236—94 **8 Claims**



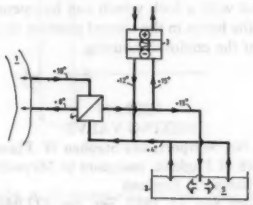
1. In a central heating system for a multiple unit building including a central heater, heating fluid delivery and return lines between the heater and each unit, a control valve for each unit in those lines and a motor driven pump connected to circulate fluid from the heater in those lines, the improvement comprising single digital flow measuring means connected to measure the aggregate flow of heating fluid in those lines to at least several of those units, digital temperature measuring means connected to measure the temperature of the heating fluid leaving the heater, separate digital temperature measuring means connected to measure the fluid temperature in each measured unit heating fluid return line, means for signalling the open or closed state of each measured unit control valve, and a digital microprocessor connected with the single digital flow measuring means, each measured unit digital temperature measuring means and each measured unit valve signalling means, arranged to measure the change in heating fluid flow when a control valve is opened or closed, the temperature differences at short regular time intervals between the heating fluid leaving the heater and the fluid in the heating fluid return line measured unit when its control valve is opened, and to multiply said changes in flow in each measured unit by said temperature differences for that unit.

4,509,680

METHOD FOR COMBINED UTILIZATION OF HEAT-CONVEYING MEDIA SUCH AS GROUND WATER OR SURFACE WATER OR THE LIKE AS A HEAT SOURCE

Leif Lemmeke, Bondevägen 9, 237 00 Bjärred, Sweden

PCT No. PCT/SE81/00371, § 371 Date Aug. 17, 1982, § 102(e) Date Aug. 17, 1982, PCT Pub. No. WO82/02085, PCT Pub. Date Jun. 24, 1982
PCT Filed Dec. 14, 1981, Ser. No. 413,367
Claims priority, application Sweden, Dec. 18, 1980, 8008906
Int. Cl.³ G05D 23/00
U.S. Cl. 237—2 B **1 Claim**



1. A method of operating a heating system including a ground water reservoir, a heat store in said ground water reservoir, a heat exchanger outside said ground water reservoir but operatively connected thereto, and heat pump means connected to said heat store, comprising the steps of:

in summer circulating water from a surface water source through said heat exchanger to thereby transfer heat from said removed water to said ground water reservoir to charge said heat store; and during the remainder of the year discharging said heat store by circulating water from the thus heated ground water reservoir through said heat pump means.

4,509,681

CONTROL UNIT FOR MAKE-UP AND COMBUSTION AIR CIRCULATION

Jimmy A. Kogut, 14660 Cavell, Livonia, Mich. 48154

Filed Oct. 11, 1983, Ser. No. 540,641
Int. Cl.³ F24D 5/00
U.S. Cl. 237—53 **5 Claims**

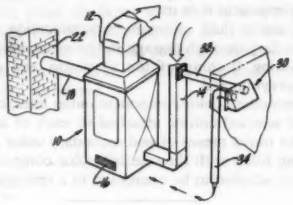
1. In an air circulating system for a building, said system being of the type including a furnace having a combustion chamber and a heat exchanger, a first duct for conducting air to said heat exchanger, a second duct for conducting air from said heat exchanger, an intermittently operable blower for drawing air through said first duct and forcing it through said heat exchanger, the passage of air through said first duct causing a reduced pressure in said first duct, and make-up air supply means communicating between the outside of said building and said first duct, the improvement comprising:

a control unit adapted to be mounted in an outside wall of said building and including a baffle and a weather protective hood,

said baffle including a baffle plate having first and second

circular openings for said make-up air and combustion air inlets, respectively, said openings being bound by first and second axially extending annular flanges and including a screen extending across each of said inlets,

said baffle also including a damper disposed within said make-up air inlet and mounted for pivotal motion inwardly of said baffle,



said make-up air supply means comprising a conduit extending from said first flange to said first duct at a location upstream of said blower whereby reduced pressure in said first duct causes said damper to open inwardly and admit outside air to said first duct,

and combustion air supply means comprising a conduit extending, independently of the conduit of said make-up air supply means, from said second flange to a location in communication with said combustion chamber.

4,509,682

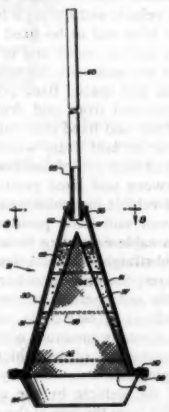
METHOD AND APPARATUS FOR FUMIGATING GRAIN AND OTHER COMMODITIES IN BULK STORAGE COMPARTMENTS

Gerald R. Heiman, Pasadena, and Frank Fleck, Arcadia, both of Calif., assignors to Pestcon Systems, Inc., Alhambra, Calif.

Filed Oct. 13, 1982, Ser. No. 433,952

Int. Cl.³ A61L 9/04; B05B 1/28

U.S. Cl. 239—60 **12 Claims**



1. A fumigating receptacle for use with solid fumigant that releases fumigating gas upon exposure to atmosphere and produces a powder residue, comprising:

an outside wall composed of material that is pervious to atmosphere and the fumigating gas, and having an inlet opening generally at its upper end for admitting solid fumigant into the receptacle;

an inside wall spaced below the outside wall and cooperating therewith to define a chamber for holding the solid fumigant in a thin layer, said inside wall being pervious to the residue to pass the latter out of the chamber;

and a bottom tray on said receptacle below said inside wall in a generally upwardly open position for collecting fumigant residue passed from the chamber and maintaining it in the receptacle.

4,509,683

APPARATUS FOR DISPERSING ATOMIZED LIQUID

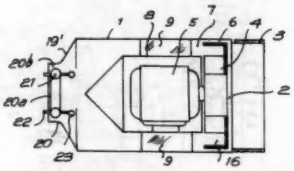
Josep Ramisa Navarro, Rbla. Sant Just, 13, Sant Just Desvern, Barcelona, Spain

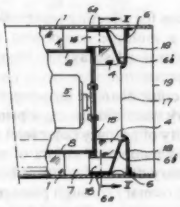
Filed Nov. 29, 1982, Ser. No. 445,065

Claims priority, application Spain, Nov. 30, 1981, 507.555; Sep. 30, 1982, 516.091

Int. Cl.³ B05B 9/06

U.S. Cl. 239—77 **6 Claims**





1. Apparatus for dispersing atomized liquid, comprising:

a casing having an open rearward end constituting air inlet means;

a centrifugal rotor mounted in said casing for rotation about an axis of rotation, said rotor including rotor blades defining an outer blade diameter, each blade having a width in the axial direction;

motor means situated in said casing for rotating said rotor;

an annular deflector integrally connected to said centrifugal rotor to rotate therewith, said deflector being concentric with said rotor and having a diameter greater than said outer blade diameter and a width substantially equal to the width of said blades, to define an open annular concentric space situated radially outwardly of the outer periphery of said rotor blades;

means defining an annular passage within said casing downstream of and communicating with said open concentric space, said annular passage being substantially coextensive with said annular concentric space;

nozzle means provided at a forward end of said casing and communicating with said annular passage; and

means for injecting liquid into the region defined by said nozzle means;

whereby rotation of said rotor jointly with said integral deflector, causes air to be drawn into said casing through said air inlet means and directed substantially radially into said open concentric space, where the flow of air is redirected by said integral deflector to a substantially axial direction, whereupon the airflow is conducted through said annular passage.

4,509,684

COLOR CHANGE APPARATUS

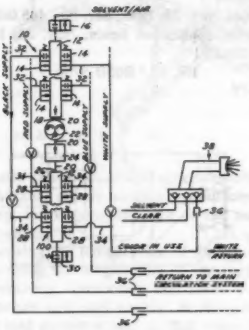
Duane C. Schowiak, Novi, Mich., assignor to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US82/01375, § 371 Date Sep. 30, 1982, § 102(e) Date Sep. 30, 1982, PCT Pub. No. WO84/01312, PCT Pub. Date Apr. 12, 1984

PCT Filed Sep. 30, 1982, Ser. No. 444,401

Int. Cl.³ B05B *15/02*

U.S. Cl. 239—112 **6 Claims**



1. An apparatus for effecting rapid color change of the color component of a multiple component sprayable fluid to be applied using a manual spraygun, characterized in that said apparatus comprises:

(A) Primary color changer means comprising

(i) a primary manifold having a primary through passage,

(ii) a plurality of primary color inlet means, one for each of a selected number of colors of said color component, said primary color inlet means being in communication with said primary through passage and being adapted to be selectively opened when the selected color component is in use and closed when it is not in use,

(iii) solvent/air inlet means in communication with said primary through passage and adapted to be opened during flushing of said apparatus and closed during spraying, and

(iv) primary outlet means in communication with said primary through passage and adapted to allow fluid from said primary through passage to flow out of said primary color changer means and into a primary outlet line;

(B) A solvent/air inlet line attached to said solvent/air inlet means and adapted to carry solvent and/or air for flushing said apparatus prior to color change;

(C) Primary color component inlet lines, one for each of said selected colors, attached to each of said corresponding primary color inlet means of said primary color changer means and filled with the selected color component;

(D) A primary outlet line adapted to carry fluid from said primary color changer means to a secondary color changer means, said primary outlet line being attached to said primary outlet means of said primary color changer means and a second inlet means of said secondary color changer means;

(E) Flushable metering means disposed in said primary outlet line between said primary color changer means and said secondary color changer means;

(F) Said secondary color changer means comprising

(i) a secondary manifold having a secondary through passage,

(ii) secondary inlet means to which said primary outlet line for conveying fluid from said primary color changer means to said secondary color changer means is attached, said secondary inlet means being in communication with said secondary through passage,

(iii) a plurality of secondary color outlet means, one for each of said selected number of colors of said color component, said secondary outlet means being in communication with said secondary through passage and being adapted to be closed during flushing of said apparatus and selectively opened when the selected color component is in use,

(iv) outlet flush means in communication with said secondary through passage and being adapted to be opened during flushing of the apparatus and closed during spraying; and

(G) Secondary color component outlet lines, one for each of said selected colors, attached to each of said secondary color outlet means of said secondary color changer, each being filled with the selected color component and each being adapted to be connected to a spraygun.

4,509,685

IRRIGATION APPARATUS

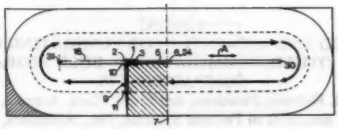
Vernon B. W. Harvey, Tanglewood, Stour Close, Little Canford, Wimborne, Dorset, England BH21 7LU

Filed Aug. 5, 1982, Ser. No. 405,535

Claims priority, application United Kingdom, Aug. 7, 1981, 8124204

Int. Cl.³ B05B *3/18*

U.S. Cl. 239—186 **6 Claims**



1. Irrigation apparatus comprising a vehicle movable between at least two predetermined fixed positions spaced apart in an area of ground to be irrigated; a hose drum mounted for rotation on the vehicle and having a hose wound thereon, the hose having an inlet end to be fixed with respect to a fixed source of water and an outlet end connected to a water-discharging device movable with the vehicle when the vehicle is moving between said spaced fixed positions; means whereby said hose is unwound from said drum when the vehicle is moving away from said fixed inlet end of said hose; means to rewind said hose on said drum when the vehicle is moving towards said fixed inlet end of said hose; means for propelling the vehicle between said fixed positions; guiding means for maintaining the vehicle in a substantially straight path during its travel between said fixed positions, said guiding means including a taut cable extending between said fixed positions and defining said straight path and steering means mounted on the vehicle and responsive to deviation of the vehicle to either side of said cable and operable to restore the vehicle to said straight path defined by said cable, said steering means comprising an arm pivotally mounted with respect to the vehicle for swinging transversely of the vehicle about an upright axis, said cable engaging said arm, whereby said arm will be swung transversely of the vehicle by the cable when the vehicle deviates sideways from the line of the cable, and means operable by the pivotal movement of said arm to impart a steering correction to the vehicle in response to said sideways deviation of the vehicle from the line of said cable, the apparatus also comprising a winch carried by the vehicle, said cable wound around said winch adjacent one end of said cable; means for driving said winch in the winding-in sense of said cable to maintain said cable taut, said cable also being arranged to be passed around at least one pulley and connectable at its end remote from said winch to an anchorage for said cable, each said pulley being attachable to a pulley anchorage at a respec-

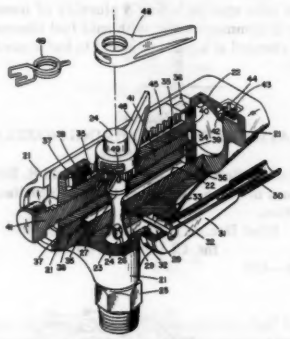
tive one of said fixed positions, whereby the vehicle will be guided by said cable towards said respective fixed position or to a plurality of said respective fixed positions in sequence, each said fixed position to which the vehicle is guided being determined by a respective said pulley being attached to a respective one of said pulley anchorages, and means whereby each said pulley is releasable from said respective anchorage, after being engaged therewith, by engagement of said pulley with the vehicle, when the latter has reached said respective pulley anchorage and said arm having at least one socket therein in each of which each said pulley is locatable before it is engaged with a respective one of said pulley anchorages and after it is released therefrom.

4,509,686

WATER SPRINKLING APPARATUS

Donald R. Larsen, 358 E. 800 North, American Fork, Utah 84003

Filed Jun. 15, 1982, Ser. No. 388,693
Int. Cl.³ B05B 3/16
U.S. Cl. 239—239 **5 Claims**



1. A fluid drive, water sprinkler device including means for imparting reciprocating or oscillating motion to a sprinkler nozzle by fluid flow through the device, said sprinkler device comprising:

a body having a water inlet connection and a main water flow passageway therein;

a spray nozzle associated with the body and in fluid flow communication with the main water flow passageway;

a piston chamber formed within the body separate and apart from the main water flow passageway;

means for diverting a portion of the water from the main water flow passageway to the piston chamber;

a piston positioned for reciprocating movement within the piston chamber;

a rack connected to the piston and extending outside of the piston chamber, said rack being adapted to move outside the piston chamber with the same reciprocating motion as the piston;

a gear associated with body and spray nozzle and adapted to mesh with the rack so as to impart reciprocating or oscillating movement to the spray nozzle as the rack moves in its reciprocating motion; and

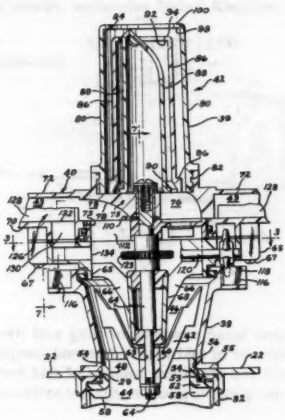
means for varying the pressure of the water within the piston chamber to thereby control movement of the piston and rack.

4,509,687

MULTIPLE SPRAY DISTRIBUTION SYSTEM FOR A DOMESTIC DISHWASHER

Donald S. Cushing, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 20, 1983, Ser. No. 515,572
Int. Cl.³ B05B 3/04
U.S. Cl. 239—245 **5 Claims**



1. A dishwashing machine including a tub for receiving articles to be washed and liquid distribution means arranged in said tub for spraying liquid onto said articles;

a liquid responsive rotable spray arm rotatable about a central axis having a liquid passage therein and a vertically extensible liquid responsive spray member movable between a non-operative retracted position and an operative extended position;

such spray arm including an inlet including a diverter means communicating with said liquid passage in said spray arm, and a passageway communicating with said extensible member;

a stationary tubular liquid receiving hub member arranged in the bottom wall of said tub defining a liquid inlet;

a valve member rotatably arranged in said spray arm inlet including a port for directing liquid between said diverter means and said passageway; and

drive means responsive to the relative rotational movement between said spray arm and said hub member for causing said valve member to continuously rotate relative to said spray arm inlet whereby said port is positioned alternatively in alignment with said diverter means and said passageway to direct liquid between said spray arm liquid passage and said extensible means as a function of liquid flowing through said hub member from said liquid inlet.

4,509,688

ONE-PIECE NEBULIZER JET

Roger A. Gagne, Los Angeles, and Rolf O. Orchard, Manhattan Beach, both of Calif., assignors to Puritan-Bennett Corporation, Los Angeles, Calif.

Filed Dec. 4, 1981, Ser. No. 327,487
Int. Cl.³ A61M 11/00
U.S. Cl. 239—338 **3 Claims**

1. A one-piece nebulizer jet, comprising:

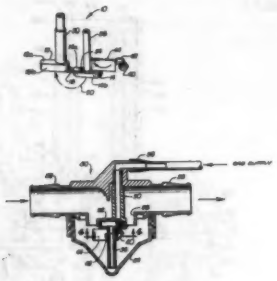
first and second complementary components each defining complementary contours of a nebulizer chamber, said components having openings in them to provide a jet inlet port, a liquid inlet port and an outlet port;

integral hinge means connecting said first and second complementary components and permitting said complemen-

tary components to be rotated with respect to each other into an assembled position;

integral means for holding said first and second complementary components in the assembled position, in which the jet inlet port and the outlet port are axially aligned;

fractionating means formed integrally with said first and second complementary components, and presenting a convex surface to the flow of fluid from the outlet port;



second integral hinge means connecting said fractionating means with one of said first and second complementary components and permitting rotation of said fractionating means to an operative position adjacent to the outlet port; and

integral retaining means, for retaining said fractionating means in its operative position, and including an arcuate element adjoining said fractionating means, and an integral post for engaging said arcuate element as said fractionating means reaches the operative position.

4,509,689

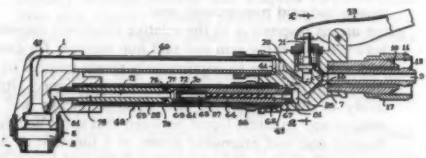
CUTTING TORCH

Chuan-Ming Kuo, 2nd Fl. No. 10 La. 22 Tung Hwa N. Rd., Taipei, Taiwan

Continuation-in-part of Ser. No. 432,169, Oct. 1, 1982, , which is a continuation-in-part of Ser. No. 395,164, Jul. 6, 1982,. This application Jun. 21, 1983, Ser. No. 506,426

Int. Cl.³ B05B *7/12*

U.S. Cl. 239—407 **20 Claims**



1. A cutting torch comprising:

a cutting head for receiving a removable cutting tip;

a valve body having an oxygen inlet, a fuel inlet, a cutting oxygen outlet, a preheat oxygen outlet, and a preheat fuel outlet communicating with said fuel inlet;

a cutting oxygen control valve for controlling the flow of oxygen from said oxygen inlet to said cutting oxygen outlet;

a preheat oxygen control valve for controlling the flow of oxygen from said oxygen inlet to said preheat oxygen outlet;

a cutting oxygen tube connecting said cutting oxygen outlet to said cutting head; and

a preheat tube connecting said preheat oxygen outlet and said preheat fuel outlet with said cutting head, said preheat tube including:

an outer tube having a first end connected to said valve body and a second end connected to said cutting head;

an inner tube the majority of which is within said outer tube and having a first end extending beyond the first end of said outer tube and a second end within said outer tube;

a nozzle fitting having a first end sealing connected to said second end of said inner tube;

a mixer tube having a first end sealingly connected to a second end of said nozzle fitting, said mixer tube having a second end sealingly connected to said cutting head,

the outer surfaces of said inner tube and said mixer tube and the inner surface of said outer tube defining a fuel channel communicating with said preheat fuel outlet; and

sealing means adjacent the first end of said inner tube for isolating said fuel channel from said preheat oxygen outlet,

said inner tube and said nozzle fitting including a central bore defining an oxygen channel communicating with said preheat oxygen outlet, said nozzle fitting having a nozzle of smaller diameter than to said oxygen bore, said nozzle being disposed at the second end of said fitting, said central core having a heat absorbing metallic spiral disposed therein upstream of said nozzle.

said second end of said nozzle fitting and said first end of said mixer tube defining a chamber of larger diameter than said oxygen channel,

said mixer tube including a central bore defining a mixing channel communicating with said chamber and said cutting head,

said mixer tube also including a plurality of transverse passageways communicating with said fuel channel and said mixing channel at a point adjacent to but spaced from said chamber.

4,509,690

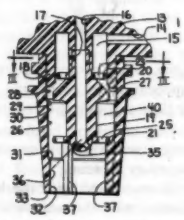
CARBONATED BEVERAGE MIXING NOZZLE FOR A DISPENSER

Forrest L. Austin, Brooklyn Center, and Jerald R. Bebeau, Coon Rapids, both of Minn., assignors to The Cornelius Company, Anoka, Minn.

Filed Dec. 6, 1982, Ser. No. 447,380

Int. Cl.³ B05B *7/06*

U.S. Cl. 239—429 **11 Claims**



7. An improved carbonated beverage mixing nozzle for a post-mix carbonated beverage dispenser having a carbonated water supply chamber co-axially surrounding a syrup supply port, said nozzle comprising:

(a) a syrup diffuser having an elongate tubular body, said body having a snap-in connector means on an upper end for connection to said syrup supply port, and a spray head in a lower end having outwardly focused outlets for spraying syrup outwardly from the diffuser and into a water outlet for a carbonated water stream around the spray head;

(b) an upper carbonated water distribution disc, said disc having a outer diameter loosely-fitted within the water supply chamber and a plurality of water openings in a circular pattern around the syrup diffuser;

(c) a lower carbonated water distribution disc spaced below the upper disc and immediately above the syrup spray head, said lower disc having an outer diameter having a greater clearance with the water outlet than a similar clearance between the upper disc and the supply chamber, said lower disc having a plurality of water openings in a circular pattern around the syrup diffuser, said lower disc openings having a greater cumulative area than the upper disc openings; and

(d) a water plenum chamber between the discs, said plenum chamber having a height greater than its annular width as measured from the syrup diffuser to an inside surface of the water outlet.

4,509,691

FUEL INJECTION NOZZLES

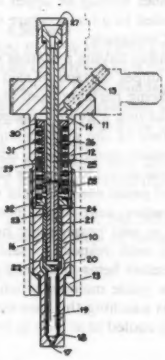
Robert T. J. Skinner, High Wycombe, England, assignor to Lucas Industries Public Limited Company, Birmingham, England

Filed Jun. 8, 1983, Ser. No. 502,169

Claims priority, application United Kingdom, Jul. 15, 1982, 8220491; Oct. 20, 1982, 8229951

Int. Cl.³ F02M *61/10, 61/20*

U.S. Cl. 239—533.9 **6 Claims**



1. A fuel injection nozzle for supplying fuel to an internal combustion engine comprising a nozzle body, a bore formed in the body and an outlet communicating with one end of the bore, a seating defined in the bore adjacent the outlet, a valve member movable within the bore and shaped for cooperation with the seating to control the flow of fuel from the bore through the outlet, a blind drilling formed in the valve member, said drilling extending from the end of the valve member remote from the seating, cross drillings in the valve member, said cross drillings acting to place the inner end of the blind drilling in communication with an enlargement defined in the bore, the portion of the valve member located between the enlargement and the seating being of reduced diameter, a tubular member extending into a chamber defined in a nozzle holder, said tubular member exterior of the holder defining a fuel inlet connected in use to an outlet of a fuel injection pump, characterized by a sleeve member slidably mounted in said drilling, said sleeve member and said tubular member engaging each other in end to end relationship to convey fuel from the inlet to the enlargement, a coiled compression spring acting to maintain said sleeve member and said tubular member in engagement, the end portion of the sleeve member adjacent the tubular member being provided with a peripheral flange, a tubular spring abutment located about said tubular member, said abutment defining a first flange for engagement with the flange on said sleeve member and a second flange, said coiled compression spring having one end which abuts against said second flange, and a further spring abutment engaged by the other end of said spring, said further spring abutment being engaged with the valve member, said compression spring acting to bias the valve member into contact with the seating.

4,509,692

DRIP OR TRICKLE IRRIGATION

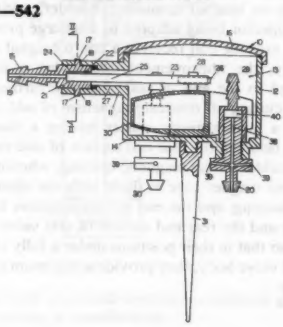
Lionel V. Moss, 88 A Borewell Rd., Whitefield, Bangalore 560066 Karnataka, India

Filed Jun. 7, 1983, Ser. No. 501,860

Claims priority, application United Kingdom, Jun. 29, 1982, 8218776

Int. Cl.³ B05B *15/00*

U.S. Cl. 239—542 **5 Claims**



1. An emitter for drip or trickle irrigation, said emitter comprising an inlet for irrigation fluid, a chamber to receive fluid from said inlet, a fluid outlet from said chamber, a variable-orifice device to control fluid flow from said inlet to said chamber, and a float member within the chamber operatively coupled to said device to vary the cross-sectional area of its orifice (and thus control the fluid flow through said inlet) upon variation of the head of fluid within the chamber;

said variable orifice device comprising a tube having one end open and connected to said inlet and having its other opposite end closed, the tube being out or slit intermediate its ends in an upper wall portion to provide said orifice and being yieldable at least in the vicinity of the wall portion below the cut or slit whereby the orifice is openable and closable by bending the two end portions of the pipe about the said yieldable lower wall portion.

4,509,693

ELECTROMAGNETIC FUEL INJECTOR

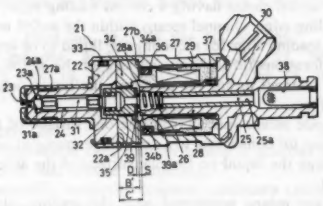
Kenji Nakai, Obu, Japan, assignor to Aisan Kogyo Kabushiki Kaisha, Obu, Japan

Filed Feb. 1, 1983, Ser. No. 463,013

Claims priority, application Japan, Feb. 18, 1982, 57-23218[U]

Int. Cl.³ B05B *1/30*

U.S. Cl. 239—585 **2 Claims**



1. In combination with an electromagnetic fuel injector for an internal combustion engine including a valve housing pro-

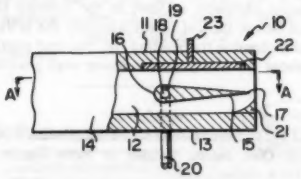
vided with a fuel injection nozzle and a valve seat at its front end and a guide hole extending along the axis of said valve housing, a valve body slideable axially in said guide hole, a compression spring adapted to normally urge said valve body in a direction toward said valve seat so as to close said fuel injection nozzle, an armature fixed to the end of said valve body furthest from said nozzle, a fixed magnet core having a front end opposite to the rear end of said armature and having a fuel passage extending through its central portion, an exciting coil surrounding said fixed magnet core, and a magnetic housing enclosing said valve housing and said fixed magnet core and having an internal mounting shoulder, said electromagnetic fuel injector being adapted to discharge pressurized fuel when said exciting coil receives a control signal to open said valve body; the improvement comprising a non-magnetic spacer fixed to the end of said armature furthest from said nozzle for cutting off residual magnetism of said fixed magnet core, and a ferromagnetic spacer having a fixed thickness interposed between the rear end surface of said valve housing and the shoulder of said magnetic housing, wherein a front end of said fixed magnet core is flush with the shoulder of said magnetic housing, and the end of said armature furthest from said nozzle and the rear end surface of said valve housing are machined so that in their positions under a fully closed condition of said valve body, they provide a maximum stroke of said valve body.

4,509,694

CROSS-CURRENT AIRFOIL ELECTROSTATIC NOZZLE

Ion I. Inculet, and Kenneth J. Hodgson, both of London, Canada, assignors to Canadian Patents & Development Limited, Ottawa, Canada

Filed Jun. 1, 1983, Ser. No. 499,983
Int. Cl.³ B05B 5/00
U.S. Cl. 239—697 **15 Claims**



1. An electrode nozzle for spraying liquid comprising:

conduit means for receiving a gas to be driven at high speed out of an opening defined by edges in the conduit means;

one or more airfoil means positioned at the conduit opening, the airfoil means having a curved leading edge, a tapered trailing edge, channel means within the airfoil means near the leading edge for receiving the liquid to be sprayed and perforations through one surface of the airfoil means to the channel means for directing the liquid onto the one surface;

electrode means spaced from the one surface of the airfoil means for connection to a dc voltage source to inductively charge the liquid on the one surface of the airfoil means; and

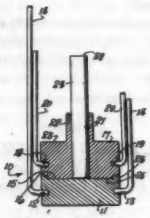
deflector means positioned near the trailing edge of the airfoil on the side of the airfoil opposite the one surface, for redirecting gas flow toward the trailing edge to atomize the liquid from the channel means.

4,509,695

TISSUE PULVERIZER

Samuel P. Bessman, Los Angeles, Calif., assignor to Spectrum Medical Industries, Inc., Los Angeles, Calif.

Filed Jul. 18, 1983, Ser. No. 514,454
Int. Cl.³ B02C 19/08, 19/12
U.S. Cl. 241—2 **14 Claims**



1. A tissue pulverizer for pulverizing specimens of living tissue for facilitating chemical or other testing, said pulverizer comprising:

a base member having an upper surface, said base member being cooled to a temperature of at least as low as −150 degrees Centigrade;

a guide member having a bottom which is removably mated with the upper surface of said base member, said guide member being partable from the base member, said guide member having a guide passageway which terminates at the interface of the guide member and the base member and said guide member being cooled to a temperature of at least as low as −150 degrees Centigrade; and

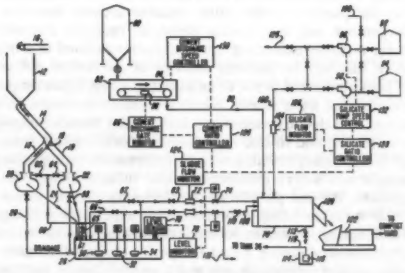
an elongated pestle member held in said passageway of said guide member, said pestle member being longitudinally movable in said passageway but having its longitudinal axis fixed with respect to said guide member and said pestle member being sufficiently long so that it protrudes above the guide member when the bottom of the pestle member is touching the base member said pestle member also being cooled to at least as low as −150 degrees Centigrade.

4,509,696

METHOD FOR TREATING LIQUID AND SEMI-SOLID ORGANIC WASTE MATERIALS

David L. Donaldson, New Orleans, La., assignor to Chemfix Technologies, Inc., Kenner, La.

Division of Ser. No. 413,025, Aug. 30, 1982, Pat. No. 4,471,916. This application Aug. 12, 1983, Ser. No. 522,755
Int. Cl.³ B02C 23/20
U.S. Cl. 241—15 **3 Claims**



1. A continuous method of treating sewage sludge, comprising the steps of:

feeding raw sludge through a mixing apparatus to work the sludge into a homogenuous mass and to reduce its viscosity initially;

feeding the worked sludge into a first end of an elongated tank and through a chopping pump located within the tank to break up large particles and to further reduce the viscosity of the sludge;

recirculating the sludge from said tank through a conduit back into said first end of said elongated tank;

pumping the sludge from a second end of said tank into a continuous mixer;

adding a quantity of setting agent into the mixer continuous;

mixing the sludge and setting agent;

adding to the mixed sludge and setting agent a quantity of an alkali metal silicate;

mixing the silicate into the sludge and setting agent; and

transferring the mixed sludge, setting agent and silicate from the mixer to a holding area where solidification reaction of the sludge, setting agent, and alkali metal silicate proceeds to completion resulting in a friable end product.

4,509,697

ROTARY DRUM SCREEN FOR WASTE MATERIAL AND ITS METHOD OF OPERATION

Hanns-Helmut Riemann, Bochum; Hans Sonnenschein, Hatzperbogen, and Heinz Skaletz, Recklinghausen, all of Fed. Rep. of Germany, assignors to Mannesmann Veba Umwelttechnik GmbH, Herne, Fed. Rep. of Germany

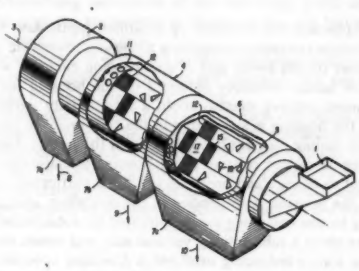
PCT No. PCT/DE82/00016, § 371 Date May 20, 1982, § 102(e) Date May 20, 1982, PCT Pub. No. WO82/02502, PCT Pub. Date Aug. 5, 1982

PCT Filed Jan. 27, 1982, Ser. No. 385,395

Claims priority, application Fed. Rep. of Germany, Jan. 29, 1981, 3102846

Int. Cl.³ B02C *17/06*

U.S. Cl. 241—72 **8 Claims**



1. A rotary drum screen assembly for waste material, comprising:

a housing;

a drum screen casing mounted in said housing for rotation during operation of said drum screen assembly to cause waste material to flow through the drum screen casing;

a first and second baffle positioned in said casing, for disrupting flow of said waste material within said casing and defining and dividing a first and second baffle zone; and

a plurality of impact plates for impacting said waste material positioned in said casing and within said baffle zones, said plates being positioned on the periphery of the casing, wherein the diameter of said casing is such as to allow for breaking up of said waste material upon impact under the force of gravity with a wall of said casing during rotation of the rotary screen casing.

4,509,698

CONDIMENT GRINDER-DISPENSER

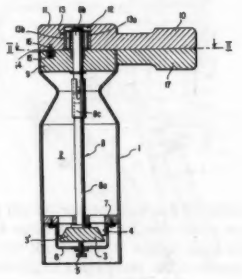
Tom David, Nantucket Island, Mass., assignor to Tom David, Inc., Nantucket, Mass.

Filed Feb. 9, 1984, Ser. No. 578,570

The portion of the term of this patent subsequent to Feb. 22, 2000, has been disclaimed.

Int. Cl.³ B02L *13/30*; A47J *42/00*

U.S. Cl. 241—169.1 **6 Claims**



1. A hand-held and hand-operated condiment grinder dispenser comprising in combination:

(a) a housing;

(b) a grinding mechanism supported in said housing and including a rotary grinding wheel for comminuting and dispensing condiment upon rotation in a sole, operative direction;

(c) an operating lever operatively coupled to said grinding wheel and being arranged for a reciprocating motion composed of alternating motions in a forward and in a return direction; said operating lever being positioned with respect to a part of said housing such that said operating lever and said part of said housing are included in a grip of a user's hand for effecting said forward motion;

(d) a spring means for urging said operating lever in said return direction, whereby upon release of said operating lever by the user's hand after a motion of said operating lever in said forward direction said spring moves said operating lever in said return direction; and

(e) an overrunning clutch connecting said operating lever to said grinding wheel; said overrunning clutch being so oriented that it transmits an operating torque from said operating lever to said grinding wheel solely in the course of forward motions of said operating lever; the direction of said operating torque coinciding with said operative direction of said grinding wheel.

4,509,699

COMPRESSION CRUSHER HAVING AN OPTIMIZED JAW CONFIGURATION

Tsuyoshi Tanaka, and Kazuhisa Yoshikawa, both of Kobe, Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jun. 29, 1983, Ser. No. 508,905

Claims priority, application Japan, Jul. 15, 1982, 57-107846[U]; Oct. 19, 1982, 57-158453[U]; Oct. 19, 1982, 57-158450[U]

Int. Cl.³ B02C *1/10*

U.S. Cl. 241—268 **8 Claims**

1. A compression type crusher which is adapted to crush feed material, said crusher comprising:

(a) a generally vertically oriented stationary crusher plate having a working surface;

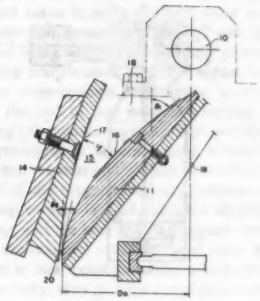
(b) a generally vertically oriented pivotable crusher plate having a working surface;

(c) the working surfaces of said stationary and pivotable

crusher plates defining a crusher chamber therebetween, said crusher chamber having an inlet region and an outlet region;

(d) said pivotable crusher plate being mounted for oscillatory pivotable movement about a fulcrum located above said crusher chamber;

(e) the entire working surface of one of said crusher plates being convex and shaped such that, in the inlet region, it is inclined away from the vertical axis by an angle of between 45° and 55°, its angle from the vertical gradually and continuously decreases in the downward direction, and, in the outlet region, it is inclined away from the vertical by an angle of between 0° and 10°;



(f) the entire working surface of the other one of said crusher plates being concave; and

(g) the angle between the working surfaces of said stationary and pivotable crusher plates being less than 27° in the inlet region of the crusher chamber and decreasing gradually and continuously in the downward direction.

4,509,700

METHOD OF AND A MACHINE FOR DISINTEGRATING MATERIALS

Anders G. Svengren, Klippan, Sweden, assignor to Nestec S.A., Vevey, Switzerland

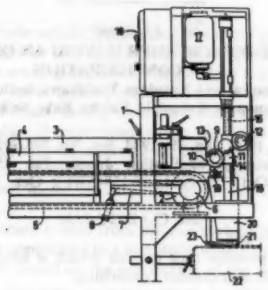
PCT No. PCT/CH79/00058, § 371 Date Jan. 2, 1980, § 102(e) Date Jan. 2, 1980, PCT Pub. No. WO79/01038, PCT Pub. Date Nov. 29, 1979

PCT Filed Apr. 26, 1979, Ser. No. 193,407

Claims priority, application Switzerland, May 8, 1978, 4990/78

Int. Cl.³ B02C *19/22*

U.S. Cl. 241—280 **6 Claims**



1. A machine for disintegrating a soft food material comprising:

(a) a disintegrating element having a pair of oppositely directed screw threads disposed about an axis, each of said threads occupying a portion of the length of said disintegrating element;

(b) means for rotating said disintegrating element about said axis in a predetermined direction, each of said threads having at its periphery a substantially continuous cutting edge directed in the axial direction in which such thread appears to move upon rotation in such predetermined direction;

(c) means for reciprocating said disintegrating element transversely of said axis, so that the disintegrating element moves in a predetermined plane of reciprocation; and

(d) means for positioning a mass of said soft food material so that a surface of said mass is disposed parallel to said plane of reciprocation and such surface is engaged by said cutting edges.

4,509,701

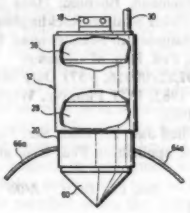
APPARATUS FOR BREAKING UP SOLIDIFIED MATERIAL IN A STORAGE CONTAINER

James M. Jack, Georgetown, and Stanley W. Mitchell, Windsor, both of Canada, assignors to Northern Vibrator Manufacturing Limited, Georgetown, Canada

Filed Aug. 19, 1983, Ser. No. 524,800

Int. Cl.³ F23J *3/00*

U.S. Cl. 241—292 **10 Claims**



1. Apparatus for breaking up solidified particulate material in a storage container comprising a housing lowerable into the container on the lower end of a suspension element, a flailing element holder rotatably mounted on the housing for rotary movement relative thereto about a substantially vertical axis when the housing is suspended in the container, an elongated flexible flailing element projecting from the holder, means for rotating the holder relative to the housing to cause the flailing element to engage and break up solidified particulate material when the housing is suspended in the container, said housing having torque-balancing means mounted for rotation relatively thereto about a substantially vertical axis, and means for rotating the torque-balancing means in a direction opposite to the direction of rotation of the flailing element holder to substantially balance torque produced by rotation of the flailing element holder and thereby substantially prevent angular movement of the housing about a vertical axis when the flailing element holder is rotated.

4,509,702

APPARATUS FOR PACKAGING A PLURALITY OF FIBERS OR STRANDS

Walter J. Reese, North Huntington, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 27, 1983, Ser. No. 461,331

Int. Cl.³ B65H *54/02*

U.S. Cl. 242—18 G **12 Claims**

1. An apparatus for producing and collecting a plurality of strands, comprising:

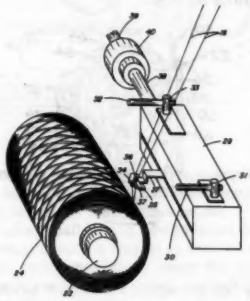
a. a means for forming a plurality of continuous fibers from a supported supply,

b. applicating means mounted beneath the supply means to treat the continuous fibers with a chemical composition,

c. gathering means mounted beneath the applicating means to gather the plurality of fibers from the forming means into more than one strand,

d. a rotatable winder to attenuate the continuous fibers and to collect the more than one strand,

e. a traversing guide having more than one slot, the slots are located linearly with one behind the previous slot after the first slot, where the linear slots are perpendicular to the axis of rotation of the winder and where each slot receives one strand, and where the slots extend into the guide and terminate with a curved end with sufficient depth to retain the strands during traversing and where the slots behind the first slot open to the peripheral surface of the guide through chambers that are arranged so the strands remain in the slots at the end of the chambers during traversing of the guide,



f. reciprocating means to which the traversing guide is nearly horizontally attached for reciprocation parallel to the axis of rotation of the rotating winder,

g. engaging means to engage the reciprocating means to start the traversing movement of the traversing guide and to disengage the reciprocating means to stop the traversing movement of the guide,

h. a drive means to effect the reciprocating movement of the traversing guide when engaged through the engaging means to the reciprocating means,

i. an adjustable contact means around each end of the reciprocating stroke of the traversing guide positioned so that the traversing guide passage by the contact means around the end of each stroke so that strands passing to or from the traversing guide are contacted by the contact means to apply tension to the strands being wound on the winder.

4,509,703

METHOD AND APPARATUS FOR TRANSPORTING AND STORING PARTIALLY OVERLAPPING SHEETS

Roland Grunder, Vordemwald, Switzerland, assignor to Grapha-Holding AG, Hergiswil, Switzerland

Filed Apr. 27, 1983, Ser. No. 489,261

Claims priority, application Switzerland, May 5, 1982, 2755/82

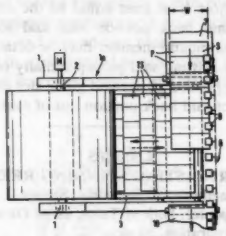
Int. Cl.³ B65H *29/28, 33/14, 5/00, 1/00*

U.S. Cl. 242—59 **17 Claims**

1. A method of temporarily storing the sheets of a stream of partially overlapping sheets having a first width between the windings of a flexible carrier which has a second width, is convoluted on a first reel and has a leader connected to a second reel, said method comprising the steps of:

(a) transporting the stream lengthwise along a predetermined path;

(b) transferring from said path successive stream sections, each of which has a length no greater than matching said second width and each of which contains a plurality of partially overlapping sheets, onto the carrier retaining said partial overlapping between the first and second reels the transferring step being performed in such a manner that each stream section extends transversely of the carrier; and



(c) advancing the carrier stepwise in a direction towards the second reel upon transfer of successive sections of the stream so that the carrier is wound onto the second reel and the sections of the stream are confined between the neighboring windings of the carrier.

4,509,704

FISHING LINE ENGAGING AND RELEASING MECHANISM IN A CLOSED-FACE TYPE REEL

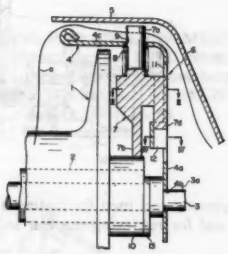
Kiyomi Ozaki, and Kikuo Tunoda, both of Hiroshima, Japan, assignors to Ryobi Ltd., Hiroshima, Japan

Filed Sep. 29, 1982, Ser. No. 427,035

Claims priority, application Japan, Nov. 30, 1981, 56-178905[U]

Int. Cl.³ A01K *89/01*

U.S. Cl. 242—84.2 A **3 Claims**



1. A closed-face type reel comprising:

(a) a fixed shaft having a sleeve fixed thereto;

(b) a spool mounted on said fixed shaft for winding a fishing line and a moveable shaft rotatably and axially moveable relative to said fixed shaft;

(c) a rotor mounted on said moveable shaft, said rotor including a sidewall having a guide hole and a guide slot communicating radially with each other and a peripheral wall having a radially directed hole; and

(d) a fishing line engaging and releasing mechanism removably mounted on said rotor and comprising a pickup member having a pickup pin moveable out of and retractable into said radially directed hole in said peripheral wall for allowing the fishing line to be wound around and reeled out of said spool respectively, and a spring acting between said pickup member and said peripheral wall for normally urging said pickup member radially inwardly, said pickup member including a tongue engageble with said sleeve for enabling said pickup pin to project out of said hole, and a back portion and a locking portion slidably and remov-

ably fitted respectively in said guide hole and said guide slot, wherein said guide slot and said locking portion have complementary semicircular cross sections with said guide slot being located on the side of said side wall adjacent said pickup member and wherein the radial length of said guide hole is at least equal to the combined radial length of said back portion and said locking portion whereby said pickup member may be detached from said side wall by shifting said pickup radially outwardly until said locking portion clears said guide slot to permit lateral movement of said back portion out of said guide hole.

4,509,705

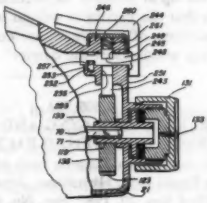
SURFCASTING SPINNING REEL

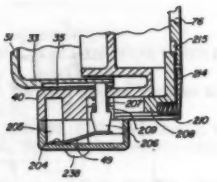
Richard R. Councilman, Collinsville; Steven L. Swisher, and Robert L. Carpenter, both of Tulsa, all of Okla., assignors to Brunswick Corporation, Skokie, Ill.

Filed Feb. 10, 1984, Ser. No. 578,876

Int. Cl.³ A01K *89/02*

U.S. Cl. 242—84.21 R **20 Claims**





13. In a spinning reel used for casting a bait attached to a fishing line and for retrieving the bait and fishing line after casting;

the reel having a housing with a forward spool end portion, a back end portion and a centershaft extending through the housing and projecting rearward into a cavity on the back end portion, a keyed portion on the centershaft extending into the cavity;

a spool carried by the forward portion of the centershaft;

a front drag acting between the spool and the centershaft to resist rotation between the spool and the centershaft;

a handcrank;

a rotatably mounted rotor connected by a transmission means to the handcrank to be rotated thereby;

an anti-reverse means carried by the housing and selectively engageable with the transmission means to prevent the rotor from being rotated in a reverse direction, the improvement comprising:

a rear drag mounted in the cavity and operatively engaging the centershaft, the rear drag comprising:

(a) drag driver means rotatably mounted in the cavity and keyed to the keyed portion of the centershaft;

(b) means acting between the drag driver means and the cavity walls for applying a drag on the centershaft;

(c) a ratchet wheel keyed to a keyed portion of the drag driver means;

(d) click means carried by the housing and having a portion engaging with the ratchet wheel to audibly signal rotation of the ratchet wheel when the line pull on the spool exceeds the drag of the rear drag; and

(e) means carried by the housing and selectively contacting the ratchet wheel for locking the ratchet wheel, drag driver means and centershaft against rotation.

4,509,706

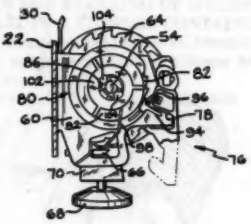
SAFETY BELT SYSTEM WITH TENSION ELIMINATING MECHANISM

Rudy V. Thomas, Sterling Heights, Mich., assignor to Allied Corporation

Filed May 10, 1983, Ser. No. 493,195

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A **9 Claims**



1. In a safety belt retraction mechanism having a rotatable shaft, a belt connected to and wound around the shaft, a spring connected to the shaft and biasing the shaft to rotate in the direction to wind the belt onto the shaft, a main ratchet wheel and a main pawl movable into engagement with the main ratchet wheel to prevent rotation of the shaft in a direction to extend the belt, a belt tension eliminating mechanism comprising:

a ratchet wheel mounted on the shaft for conjoint rotation therewith, said ratchet wheel including a hollow shaft;

a pawl member have a pawl movable into engagement with said ratchet wheel to prevent the rotation of the shaft in a direction to wind the belt onto the shaft and an integral stop projection spatially separated from said pawl;

a first member rotatably journaled on said hollow shaft and disposed adjacent to said ratchet wheel, said first member having a peripheral cam surface about a predetermined portion of the circumference for blocking the engagement of said pawl with said ratchet wheel and a first projection adjacent to the periphery extending axially away from said ratchet wheel;

a second member rotatably journaled on said hollow shaft and disposed adjacent to said first member, said second member having a second projection extending radially from its periphery between said pawl and said stop projection to limit the rotation of said second member, said second projection having a blocking surface on the side adjacent to said pawl for blocking the engagement of said pawl with said ratchet wheel when said second projection is engaging said pawl, said second projection further being engaged by said first projection limiting the rotation of said first member with respect to said second member to approximate one full revolution;

a compression spring carried on said hollow shaft for biasing said first and second members and said ratchet wheel in frictional engagement;

means for retaining said first and second members and said compression spring on said hollow shaft; and

means for locking said ratchet wheel on the shaft.

4,509,707

SELF-LOCKING BELT REELING DEVICE FOR MOTOR VEHICLE SAFETY BELTS

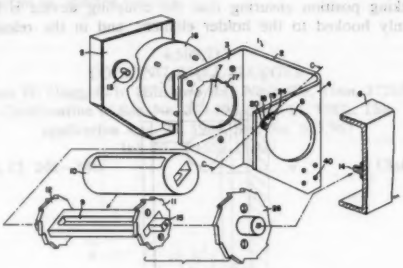
Hans-Hellmut Ernst, Sülfeld, and Holger Seel, Aidlingen, both of Fed. Rep. of Germany, assignors to AUTOFLUG GmbH, Rellingen, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 260,034, May 4, 1981, abandoned. This application Oct. 11, 1983, Ser. No. 540,818

Claims priority, application Fed. Rep. of Germany, May 3, 1980, 3017097

Int. Cl.³ A62B *35/02*; B65H *75/48*

U.S. Cl. 242—107.4 A 20 Claims



1. A self-locking belt reeling device, comprising:

a housing having a first and a second aperture, said second aperture being provided with a recess;

a belt rewinding shaft having two ends and being mounted in said housing in such a way as to prevent axial movement yet allow radial movement under the action of locking forces, said ends of said shaft extending through said apertures of said housing;

a disc respectively provided near each end of said shaft, said discs being respectively located in the plane of the associated aperture, with at least that disc associated with said second aperture being a toothed disc, at least one of said apertures being provided with a fixed inner toothing for engagement by the associated disc when locking forces occur;

a latch pivotably mounted in said recess of said second aperture in such a way as to be pivotable into said second aperture and into the toothing of said toothed disc associated therewith;

an actuating element arranged on said latch; and

a device, for actuating self-locking, associated with said housing and controlling said actuating element, said device sensing forces requiring locking of said belt rewinding shaft.

4,509,708

MECHANISM IN ROLL-UP DEVICE FOR SAFETY BELTS IN MOTOR VEHICLES

Artur Föhl, Schorndorf, Fed. Rep. of Germany, assignor to REPA Feinstanzwerk GmbH, Alfdorf, Fed. Rep. of Germany

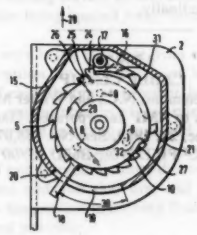
Filed Feb. 23, 1983, Ser. No. 468,978

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1982, 3206596

Int. Cl.³ A62B *35/00*; B65H *75/48*

U.S. Cl. 242—107.7 14 Claims

1. A safety belt retractor assembly comprising a base, a spool rotatably mounted on said base and adapted to be connected with a safety belt, biasing means for urging said spool to rotate in a direction tending to wrap the safety belt around said spool to thereby press the safety belt against an occupant of a vehicle after the safety belt has been connected, and comfort means for holding said spool against rotation under the influence of said biasing means to thereby relieve the pressure applied against the occupant of the vehicle by the connected safety belt, said comfort means including a ratchet wheel which is connected with said spool for rotation therewith, a pawl which is connected with said base and is movable between an engaged position engaging said ratchet wheel to hold said spool against rotation under the influence of said biasing means and a disengaged position in which said pawl is ineffective to hold said spool against rotation, first and second coaxial cam means rotatable between a blocking orientation in which at least one of said first and second cam means is effective to maintain said pawl in a disengaged position and a nonblocking orientation in which said first and second cam means are ineffective to maintain said pawl in a disengaged position, stop means for limiting rotation of said first cam means in one direction relative to said



base, and means for rotating at least one of said first and second cam means from a blocking orientation to a nonblocking orientation in response to withdrawal of a short length of the safety belt from said spool, said means for rotating at least one of said first and second cam means including a plurality of rotatable force transmitting elements having spherical outer side surfaces disposed in engagement with said first cam means, and means for rolling the spherical side surfaces of said force transmitting elements along said first cam means while said stop means prevents rotation of said first cam means in the one direction.

4,509,709

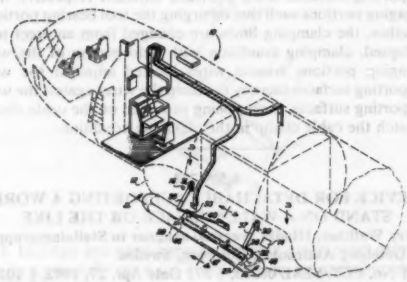
SWINGING POD ANTENNA MOUNT

Charles G. Utton, Mesa, Ariz., and Bill D. Stratman, Pomona, Calif., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 18, 1983, Ser. No. 467,707

Int. Cl.³ B64C *1/36*

U.S. Cl. 244—118.1 6 Claims



1. A swinging pod antenna mount for use on vehicles, such as airplanes and the like, comprising:

an elongated antenna pod designed to be mounted with its longitudinal axis parallel to the vehicle's direction of travel;

a plurality of mounting lugs affixed to said pod to define a first line parallel with the longitudinal axis of said pod and to define a second line spaced vertically from the first line and parallel with the longitudinal axis of said pod;

a plurality of struts each affixed adjacent one end to said

vehicle and adjacent the other end to one of said lugs defining the first line, said struts being affixed to said lugs for pivotal movement of said pod about the first line and so that the first line is spaced from the vehicle a predetermined amount and parallel with the vehicle's direction of travel; and

a longitudinally extendable member affixed adjacent one end to the vehicle and affixed adjacent the other end to one of said lugs defining the second line for pivotal movement of said pod about the first line between an operating position, when said extendable member is retracted, and a maintenance position, when said extendable member is fully extended longitudinally.

4,509,710

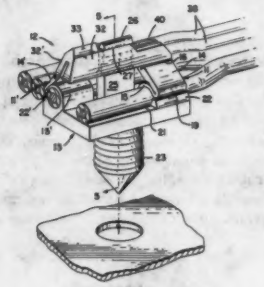
CABLE CLAMP

Ralph M. Cooper, Clemmons, N.C., and Walter M. Mena, Marietta, Ga., assignors to AMP Incorporated, Harrisburgh, Pa.

Filed Dec. 23, 1983, Ser. No. 565,078

Int. Cl.³ F16L *3/08*; B65D *63/00*

U.S. Cl. 248—73 **13 Claims**



1. A cable clamp moulded in one piece from plastics material comprising first and second clamping limbs extending in side-by-side relation and joined at respective opposite ends by tool bearing portions, each clamping limb comprising a rigid portion at one end of the limb joined to a flexible wire engaging portion at the other end of the limb, laterally extending wire supporting surfaces being provided adjacent respective wire engaging portions such that on urging the tool bearing portions together, the clamping limbs are changed from an erect to a collapsed, clamping condition with deformation of the wire engaging portions around wires located adjacent the wire supporting surfaces thereby to clamp the wires against the wire supporting surfaces, means being provided on the cable clamp to latch the cable clamp in the clamping condition.

4,509,711

DEVICE FOR DETACHABLY SUPPORTING A WORK STAND ON A WALL SURFACE OR THE LIKE

Harry Wallther, Hindås, Sweden, assignor to Stallningsgruppen i Goteborg Aktiebolag, Goteborg, Sweden

PCT No. PCT/SE81/00253, § 371 Date Apr. 27, 1982, § 102(e) Date Apr. 27, 1982, PCT Pub. No. WO82/01026, PCT Pub. Date Apr. 1, 1982

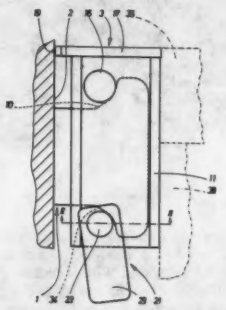
PCT Filed Sep. 10, 1981, Ser. No. 375,280

Claims priority, application Sweden, Sep. 11, 1980, 8006368

Int. Cl.³ A47G *29/02*

U.S. Cl. 248—235 **5 Claims**

1. A device for supporting an object detachably at a wall surface, comprising: a supporting member for the object; a coupling device to be fitted to the supporting member; said supporting member having a supporting surface to rest against the wall surface below the coupling device; a holder element having a plate-shaped body with at least one attachment surface to be fixed to the wall surface, and having at least two hooking-up portions which are directed away from one another, one directed upwardly and the other downwardly, each hooking-up portion having a bearing surface partially turned towards the wall surface; said coupling device comprising: two portions provided with guide surfaces facing one another and forming therebetween a gap for receiving said holder element, and also a first, upper locking member positioned in the gap and adapted to be hooked up to the hooking-up portion which is directed upwardly; the coupling device further comprising a locking device movable between a locking position and a releasing position and vice versa, said locking device in the locking position ensuring that the coupling device is held firmly hooked to the holder element, and in the releasing



position, allowing the coupling device to be unhooked from the holder element; the holder element being substantially symmetrical relative to at least a central axis extending symmetrically from said wall surface; said locking device also having a second, lower locking member cooperating with the downwardly directed hooking-up portion in the locking position of the locking device to prevent the coupling device from being unhooked from said holder element, said coupling device having at least one, upper supporting surface for bearing against said wall surface, said bearing surfaces of the hooking-up portions having an inclined or curved portion allowing the bearing point between the upper locking member and the bearing surface cooperating therewith to be chosen such that support of the upper support surface against the wall surface is assured.

4,509,712

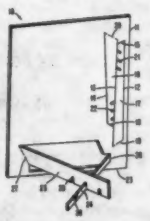
EASEL FORMED BY TWO CROSSED TABS AT BACK OF DISPLAY OBJECT

Carl Moller, 101 W. 57th St., New York, N.Y. 10019

Filed Jan. 24, 1983, Ser. No. 460,479

Int. Cl.³ A47B *97/04*

U.S. Cl. 248—464 **20 Claims**



1. An easel for holding a display object in an upward position when placed on a support surface, which comprises a first elongate flexible tab disposed near and along the bottom edge

of said display object and hinged at the back of said display object near one lateral edge of said display object, a second elongate flexible tab disposed above and along said first tab and hinged at the back of said display object near the opposite lateral edge of said display object, the hinge lines of said first tab and said second tab being slanted so that the distances between the bottom ends of said hinge lines and between the top ends of said hinge lines are unequal, at least one first notch in the top edge of said first tab, and at least one second notch in the bottom edge of said second tab, said first notch and said second notch being adapted to lock said first tab and said second tab in crossed relation in order to hold said display object in an upward position.

4,509,713

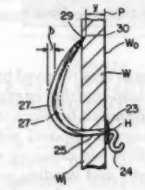
LOCKING WALL HANGER

James W. Hogg, 6216 Hillsboro Rd., Nashville, Tenn. 37215

Continuation of Ser. No. 377,192, May 11, 1982,. This application Aug. 24, 1984, Ser. No. 643,767

Int. Cl.³ F16M *13/00*

U.S. Cl. 248—546 **9 Claims**



1. A locking wall hanger mounting in a wall for supporting articles thereon, comprising:

in combination with a wall, a curved wire having a first end, a second end, and a central portion;

said first end being adapted to receive articles for hanging thereon;

an abutment member fixed to said curved wire at a location adjacent said first end;

said abutment member having a wall contacting surface;

said second end terminating in a sharp point;

said second end being adapted to pierce said wall and being inserted therethrough, said insertion defining a straight passage through said wall;

said curved wire being sufficiently resiliently deformable that passing of said curved wire into said wall results in a passage having a snug fit about said wire and causes temporary resilient straightening of any portion of said wire passing through the wall so that the diameter of the passage is not substantially greater than that of the wire that during insertion of said wire therethrough;

said central portion being generally in the shape of a parabola; a first portion of said curved wire adjacent said first end being substantially straight along a predetermined length thereof;

said first portion of said curved wire being connected to said central portion of said curved wire, said first portion being disposed in the passage;

in an undeformed condition, said sharp point terminating at a predetermined distance "X" as measured from a line perpendicular to a plane which contains said wall contacting surface and which is generally perpendicular to said straight portion of said curved wire;

said distance "X" being less in value than the thickness of the wall in which said curved wire is inserted;

said curved wire being adapted for manual insertion into the wall;

said central portion of said curved wire having a minimum radius of curvature sufficiently large that the passageway is not enlarged due to a spring force in said central portion, which force tends to return said central portion to its original parabolic shape during insertion of said central portion into the passage; said minimum radius of curvature being sufficiently small that said second end substantially overlies a substantial portion of said first portion of said curved wire;

said curved wire having a first position wherein said curved wire passes snugly through the passage in the wall created by said second end, with said sharp point of said second end contacting a rear side of the wall and said first end remaining on a front side of the wall, without deformation of said central portion of said curved wire;

said wall contacting surface of said abutment member in said first position being spaced away from the front surface of the wall;

said curved wire being movable from said first position to a second position by movement of said wall contacting surface of said abutment member into contact with the wall; said central portion of said curved wire being resiliently deformed in going from said first position to said second position such that said force arises in said central portion of said curved member due to its resiliency urging said second end and said first end toward one another creating a snap action in moving from said first position to said second position;

said force tending to retain said abutment member in said second position adjacent the wall;

whereby said second position is stable due to resiliency of said curved wire, so that a snap action retains said abutment member against the wall even when no external load is applied to said first end, and

whereby due to the resiliency of said curved wire, the passage in said second position remains snugly fitting and is not substantially enlarged from its initial size when it is created by entry of said second end into the wall.

4,509,714

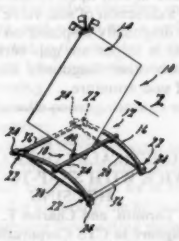
PORTABLE WIND-RESISTANT SIGN STAND WITH FLEXIBLE BOW-TYPE LEGS

James R. Seely, Rochester, Mich., assignor to Marketing Displays, Inc., Farmington Hills, Mich.

Filed Jul. 14, 1983, Ser. No. 513,852

Int. Cl.³ G09F *1/00*

U.S. Cl. 248—618 **20 Claims**



1. In a sign and stand apparatus having a sign panel protruding in a generally outward direction from an unanchored and readily portable base assembly, said sign panel being supported by said base assembly, the improvement wherein said base assembly includes at least one base member which is flexible and resilient in bending, mounting means for securing said sign panel to said base assembly, and retainer means for releasably engaging said base member to cause said base member to be resiliently and bendably deflected from an unflexed condition to a resiliently flexed generally arcuate bow-shaped condition, said flexed and generally bow-shaped base member being adapted to further resiliently deflect in response to loads exerted on said sign and stand apparatus in directions generally transverse to said sign panel in order to substantially prevent

said sign and stand apparatus from tipping over in response to said transverse loads.

4,509,715

PRESSURE CONTROL VALVE

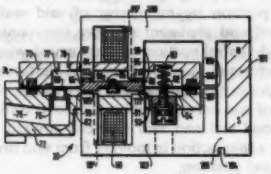
Hans Kubach, Korntal-Münchingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 425,591

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225179

Int. Cl.³ F16K *31/02*

U.S. Cl. 251—138 **2 Claims**



1. A pressure control valve including a permanent magnet for producing a permanent magnetic field having a North and South polarity; an electromagnetic coil coupled with said permanent magnet for inducing an electromagnetic field; a pressure plate; a valve seat, said pressure plate opening said valve seat to a greater or lesser extent; an armature coupled with said pressure plate and located within said electromagnetic field induced by said electromagnetic coil and said permanent magnetic field; said armature being disc shaped and rotatably supported between two pairs of separate pole shoes disposed on a pair of yokes on opposite sides of said armature, which forms an air gap on opposite sides of said armature; said pole shoes located on said yokes on opposite sides of said armature having a same polarity induced by said permanent magnet; and one of said pair of yokes includes a magnetic restriction, said electromagnetic field at said pole shoes located on said yokes on opposite sides of said armature being arranged to extend in the same direction, whereas the electromagnetic field at the pole shoes aligned on opposite sides of the armature extends in an opposite direction of the permanent magnetic field, characterized in that upon rotational movement of said pressure plate in a direction of said valve seat, at least two pole shoes which are diagonally disposed on opposite sides of said armature provide a larger air gap surface area facing said armature than two other diagonally disposed pole shoes on opposite sides of said armature.

4,509,716

ELECTROMAGNETICALLY OPERATED HYDRAULIC VALVE DEVICE WITH SNAP-TOGETHER VALVE HOUSING

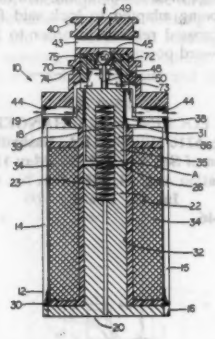
Michael Barber, Toronto, and Charles F. Lloyd, Rexdale, both of Canada, assignors to CTS Corporation, Elkhart, Ind.

Filed Sep. 30, 1983, Ser. No. 537,532

Int. Cl.³ F16K *31/02*; H01F *7/00*

U.S. Cl. 251—141 **18 Claims**

1. A fast response electromagnetic hydraulic valve device, comprising a housing having a plurality of longitudinal openings disposed therein and a bushing disposed at one end thereof, a core providing end closure means for an end of said housing oppositely disposed from said bushing, said core including a longitudinal core post projecting inwardly of said housing and having an opening in said post, a bobbin having a central opening therein receiving said post, winding means supported by said bobbin and circumposing said core post, an armature movable longitudinally within said housing with one end received in the central opening of said bobbin and the other end disposed within the bushing, the one end of the armature having an opening disposed opposite the post opening, resilient means received by the post and armature openings, sleeve means disposed between said bushing and the other end of the armature and providing a constant cross section nonmagnetizable gap between said armature and bushing, an outer valve casing secured over said bushing and having an interior cavity with a circumferential groove disposed about the cavity, an inner valve casing disposed within said interior



cavity and a circumferential boss received by said circumferential groove to provide a snap-together engagement of the valve casings, a valve cavity disposed between the inner and outer valve casings, a valve member disposed within the valve cavity, and a free-floating drive pin engaging said valve member and the armature, whereby said winding means is energizable to effect almost instantaneous displacement of said armature and associated drive pin.

4,509,717

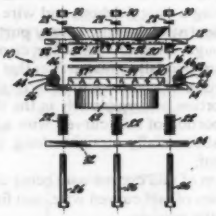
SLIDE GATE VALVE FOR DRY BULK DISCHARGING CONTAINERS

Dennis C. Wright, Conneaut, and Ernest J. Camodeca, Ashtabula, both of Ohio, assignors to Elkem Metals Company, Pittsburgh, Pa.

Filed Mar. 14, 1983, Ser. No. 475,273

Int. Cl.³ F16K *51/00*

U.S. Cl. 251—144 **6 Claims**



1. A container for transporting dry materials in bulk having a discharge aperture in the bottom thereof and a valve assembly for opening and closing said discharge aperture comprising:

(a) a first plate member that extends out beyond the exterior wall of the periphery of said discharge aperture in the bottom of said container and has an aperture therein aligned with said discharge aperture,

(b) a second plate member that extends out beyond the exterior wall of the periphery of said discharge aperture in the bottom of said container and has an aperture therein aligned with said aperture in the first plate member,

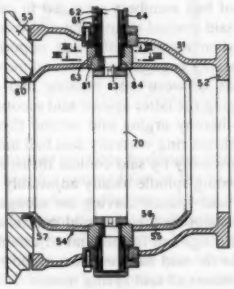
(c) a third plate member that extends out beyond the exterior wall of the periphery of said discharge aperture in the bottom of said container and has an aperture therein aligned with said aperture in said second plate member,
(d) one side of said first plate member being fixed to the bottom of said container,
(e) means carried by said first plate member in position outside the exterior wall of the periphery of said discharge aperture in the bottom of said container for supporting the second and the third plate members with the apertures therein aligned with the aperture in said first plate member,
(f) a solid gate valve member slidably mounted between said first and second plate members,
(g) resilient means between said second and third plate members positioned outside the exterior wall of the periphery of said discharge aperture in the bottom of said container for exerting positive pressure against said second plate member to move it against said solid gate valve member and force it into a resilient sealing relationship with said first plate to close said discharge aperture, and
(h) cam means in position outside the exterior wall of the periphery of said discharge aperture in the bottom of said container for releasing the positive pressure of said resilient means whereby said solid gate valve member may be slidably removed to open said discharge aperture.

4,509,718

BALL VALVE WITH ROTARY-TRANSLATORY MOVEMENT FOR FLUID PRODUCTS AT VERY HIGH OR VERY LOW TEMPERATURE

Giorgio Bormioli, Via Galileo Galilei, 11 - 35100 Padova, Italy

Filed May 31, 1983, Ser. No. 499,325
Claims priority, application Italy, Oct. 27, 1982, 23948 A/82
Int. Cl.³ F16K *25/00*
U.S. Cl. 251—163 **5 Claims**



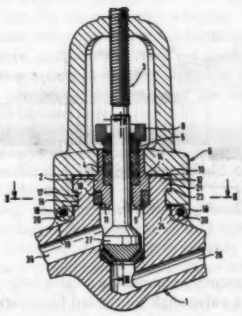
1. Ball valve with rotary-translatory movement for controlling the flow of fluid products passing at very high or very low temperatures, comprising a duct section through which can be passed a fluid product, a ball which can be moved to closing and opening positions in said duct section with seqeuntial movements of rotation and translation, and a control device including a single control shaft able to cause each of said sequential movements through the continuous rotation of said control shaft characterized in that said control device comprises further a first rotatable body integral with said control shaft, a second rotatable body, and connection and release means responsive to a closing rotation of said control shaft in one direction to first keep said bodies connected with each other for rotation in unison and to then stop said second body and to free said first body therefrom for rotation relative to said second body, and vice-versa in response to an opening rotation of said control shaft in the opposite direction, and said ball being coupled to said rotatable bodies of the control shaft so that said rotation in unison causes a movement of mere rotation of the ball around an axis perpendicular to that of said duct section, and wherein the rotation of the first body relative to said second body causes a movement of mere translation of said ball in a direction perpendicular to the above first-mentioned axis, said ball comprising an approximately spherically shaped body having thereon a hub connected to said second body for rotation therewith and a slide rotatably mounted on an eccentric on said first body and slidably connected to said hub to impart said translational movement to said spherical body.

4,509,719

VALVE COVER SEALING

Vilho Uomala; Jouko Kärkkäinen, and Kjell Sandström, all of Pietarsaari, Finland, assignors to Oy Wartsila Ab, Helsinki, Finland

Filed Mar. 16, 1983, Ser. No. 475,861
Claims priority, application Finland, Mar. 24, 1982, 821044
Int. Cl.³ F16K *31/34*
U.S. Cl. 251—214 **10 Claims**



1. A valve comprising:
a valve housing which defines a valve chamber and a bore extending between the valve chamber and the exterior of the valve housing, and which has a surface surrounding the bore and directed to the exterior of the valve housing;
a detachable valve lid having a surface which confronts said surface of the housing;
an elongate valve spindle passing through said lid and entering the valve chamber;
a gasket member which is fitted between said surface of the valve housing and the confronting surface of the lid and which is elastically compressible by at least 5%; and
a clamping member for clamping the lid to the valve housing by means of a clamping force acting mainly in the longitudinal direction of the valve spindle, whereby the gasket member is compressed between the confronting surfaces of the valve housing and the lid and the elasticity of the gasket member maintains a continuous sealing contact pressure between said gasket member and both said lid and said surface of the housing,
and wherein the valve housing comprises guiding means for guiding said clamping member into a locking position relative to said valve housing, in which position the lid is clamped to the valve housing, said guiding means requiring at least first and second consecutive movements of the clamping member relative to the valve housing, said first movement being an essentially linear movement in the longitudinal direction of the valve spindle and said second movement being a rotational movement about the spindle.

4,509,720

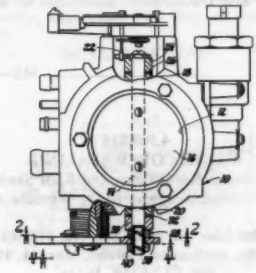
VALVE SHAFT END FLOAT CONTROL

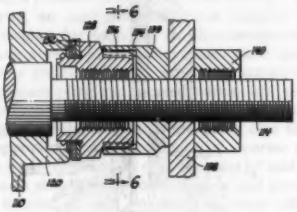
Michael D. Griffin, Rochester; John A. Gural, Pittsford, and Donald J. Lamirande, Spencerport, all of N.Y., assignors to General Motors Corporation, Detroit, Mich.

Filed Jul. 7, 1983, Ser. No. 511,534

Int. Cl.³ F16K 1/22; F16D 1/12

U.S. Cl. 251—308 **2 Claims**





1. A valve assembly comprising a valve body defining a fluid flow passage, a valve shaft journalled for rotation in said body and extending across said passage, a valve member in said passage secured to said shaft and rotatable with said shaft to control flow through said passage, said body having an external boss, and wherein said shaft has a threaded end projecting from said boss, a nut is threaded on said end of said shaft, the position of said nut on said shaft being adjustable during assembly for establishing a selected clearance between said nut and said boss to thereby limit end float of said shaft, a retainer is secured to and rotatable with said shaft, and said retainer has an interfering engagement with said nut for preventing rotation of said nut about said shaft and consequent axial movement of said nut along said shaft to thereby maintain said clearance.

4,509,721

OPERATING MECHANISM FOR A HIGH-PRESSURE VALVE HAVING A VALVE PASSAGE OF RELATIVELY SMALL WIDTH

Gunter M. Lassally, Amsterdam, Netherlands, assignor to Amstelstaal B.V., Netherlands

Filed Jun. 6, 1983, Ser. No. 501,491

Claims priority, application Netherlands, Jun. 22, 1982, 8202513

Int. Cl.³ F16K 41/10

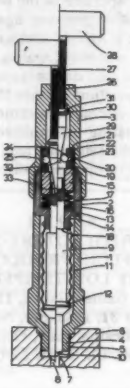
U.S. Cl. 251—335 B **6 Claims**

1. An operating mechanism for a high-pressure valve having a valve body with a valve passage of relatively small width and a movable valve element for opening and closing said passage, said mechanism comprising

valve stem means carrying said valve element at one end thereof, a housing adapted to be mounted on said valve body and receiving said valve stem means for axial sliding movement,

sealing means for sealing said valve stem means with respect to said housing, a first stationary thrust ring in said housing having a central opening, a second movable thrust ring in said housing axially spaced from said first thrust ring and having a central opening coaxial with said first thrust ring central opening, said second thrust ring being axially movable with respect to said first thrust ring,

each one of said two thrust rings having on its side facing the other of said thrust rings an annular end face having an inwardly bevelled conical shape whereby said two opposing end faces of said two thrust rings enclose therebetween an annular space of radially inwardly increasing axial width,



a plurality of ball members arranged in said annular space between said conical thrust ring end faces,

said valve stem means on the side opposite of said valve element axially engaging said second movable thrust ring,

spring means between said housing and said valve stem means urging the latter against said second movable thrust ring and thereby urging said second thrust ring towards said first thrust ring whereby said ball members are urged radially inwardly by said conical thrust ring end faces,

and an operating spindle axially adjustably mounted in said housing, said spindle having an elongate tapering end portion projecting through said central openings of said two thrust rings and forming an adjustable tapering holding surface for said ball members urged radially inwardly by the pressure of said spring means.

4,509,722

COMPOSITE VALVE SEAT

Tadashi Ebihara, Saitama, Japan, assignor to Nippon Piston Ring Co., Ltd., Tokyo, Japan

Filed Feb. 23, 1982, Ser. No. 351,385

Claims priority, application Japan, Feb. 26, 1981, 56-26117

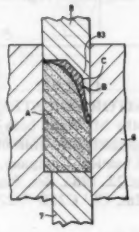
Int. Cl.³ F01L 3/00

U.S. Cl. 251—359 **4 Claims**

1. A composite valve seat formed around a core rod by compressing first and second layers within a surrounding die between upper and lower punches, said valve seat comprising:

first and second zones, said first zone comprising said first layer and being made of a first sintered alloy powder, said second zone comprising said second layer and being made of a second sintered alloy powder, a boundary between said first and second sintered alloy powders having a rest-curvelike shape formed by relative movement between said die and lower punch after said first sintered

alloy powder is deposited within said die on an upper surface of said lower punch but prior to said second sintered alloy powder being deposited on said first sintered alloy powder.

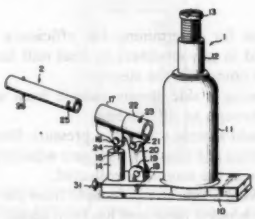


4,509,723

PORTABLE HYDRAULIC LIFTING JACK

Tatsuo Shimura, Tokyo, Japan, assignor to Yasui Sangyo Co., Ltd., Fujinomiya, Japan

Filed Jun. 28, 1983, Ser. No. 508,580
Int. Cl.³ F15B *15/18*
U.S. Cl. 254—93 H **3 Claims**



1. A lever activated portable hydraulic lifting jack of relatively compact size for automobiles or the like, comprising:

a main body supporting a plunger cylinder and a ram cylinder in upright orientation, said jack being provided in said main body with a release valve having a rotatable bolt head activated by a slotted end provided in said lever;

a plunger receivable in said plunger cylinder;

a ram receivable in said rom cylinder; and

a two-piece socket comprising a first piece and a second piece for slidably receiving a lever therethrough for activating said plunger, said first piece being pivoted to the main body and being provided with a pin for engageably receiving grooves provided in the forward end of said lever;

said second piece being pivoted to the upper end of said plunger so that the distance between said two pieces of said socket is adjustable, and the second piece of the socket freely receives said lever until the second piece comes into contact with a stopper provided in said lever at a predetermined distance from said slotted end of said lever;

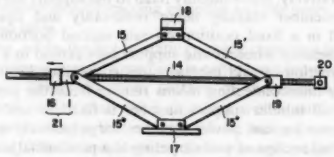
whereby said jack is adapted to lift a wide range of loads without any rotation of said lever and whereby the ratio of the stroke of said lever to that of said plunger is very depending upon the separation of said socket pieces by said lever.

4,509,724

PANTAGRAPH TYPE JACK

Hiroshi Okada, Seto, Japan, assignor to Mitsuchi Corporation, Nagoya, Japan

Filed May 11, 1983, Ser. No. 493,553
Claims priority, application Japan, May 15, 1982, 57-70988[U]
Int. Cl.³ B66F *3/08*
U.S. Cl. 254—126 **2 Claims**



1. In a pantagraph jack of the type in which support bars forming parallel links are provided with a bolt support at one of their two connection portions and with a bolt-receiving nut at the other, and in which an actuating bolt is inserted into said two connection portions through said bolt support and said bolt-receiving nut, the improvement wherein:

a casing of said bolt-receiving nut is formed with a tapered through bore, said bolt-receiving nut comprising separate nut segments arranged slidably therein in the direction of the taper and being biased toward the smaller-diameter end of said tapered bore;

said bolt-receiving nut including an actuating member slidably mounted over said casing for thrusting said nut segments toward the larger-diameter end of said tapered bore; and wherein

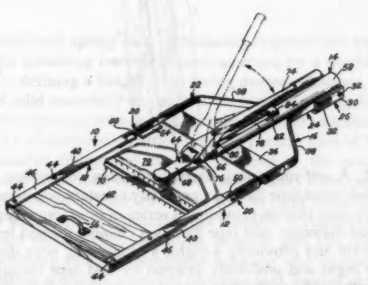
said actuating member for thrusting said nut segments toward the larger-diameter end of said tapered bore comprises an actuating ring which is slidably fitted over the outer surface of said casing, and a sleeve integrally formed with said actuating ring and having a center bore into which said actuating bolt is inserted; and wherein said sleeve is provided with openings into which said nut segments are fitted and engagement portions which engage with rear end faces of said nut segments.

4,509,725

CARPET REPAIR MECHANISM

Victor T. Talavera, Chicago, Ill., assignor to Talavera Corporation, Chicago, Ill.

Filed Jan. 3, 1983, Ser. No. 455,340
Int. Cl.³ A47G *27/04*
U.S. Cl. 254—212 **4 Claims**



1. A mechanism for drawing first and second adjacent sections of previously laid and stretched carpeting towards one

another for purposes of facilitating the repair of a selected section of said carpeting, said mechanism comprising, in combination a frame assembly having first and second portions, the second portion having support bars, means for pivotally interconnecting said first and second portions together, means mounted on said first portion of said frame assembly for selectively engaging said first section of said carpet, wherein the engaging means comprises a support member and a plurality of projecting teeth thereon, a power member including a tubular support member, the tubular support member being removably and operatively, non-rotatably fixed to the support bars and the power member thereby being removably and operatively mounted in a fixed position on said second portion of said frame assembly wherein said support bars extend in a longitudinal direction of said tubular support member locating said pivotally interconnecting means remote from the position at which said tubular support member is fixed to said support bars, means on said power member for selectively engaging said second section of said carpeting in a position adjacent said second portion of said frame assembly, a drive section on said tubular support member of said power member movable from a first position to a second position by use of external force, said carpeting sections being in their original positions when said power member is in its first position and being in a drawn together position when said power member is forcibly moved to said second position while both of said carpeting engaging means are engaged with said carpeting, said carpet engaging means on said power member being movable towards said carpet engaging means provided on said frame assembly so that said selected section of said carpeting is more easily repairable when said carpeting sections are in said drawn together position.

4,509,726

BARRIER

William G. Boggs, Phoenix; David S. VanDenburgh, Paradise Valley, and Gabriel A. Valdez, Tolleson, all of Ariz., assignors to American Security Fence Company, Phoenix, Ariz.

Filed Oct. 17, 1983, Ser. No. 542,513

Int. Cl.³ B21F 25/00

U.S. Cl. 256—8 **4 Claims**

1. A self-supporting barrier structure comprising an elongated metal tape having a generally constant edgewise arcuate curvature therein providing a series of interconnected coils of equal diameter, said tape having a channel formed lengthwise therein and providing a bight, a reinforcing wire disposed in the bight and uniformly gripped by said tape throughout its length, said tape further having continuous reinforcing flange regions extending from opposite sides of said coil channel and barbs formed at spaced intervals along said tape and extending outwardly of the extent of said flange regions, said barbs formed in pairs with the individual barbs in each pair extending in opposite directions and each pair having a root portion connecting the pair to the flange region of the tape, the width of the flange regions of the tape adjacent each barb root being narrower than the wider flange regions elsewhere along the tape.

4,509,727

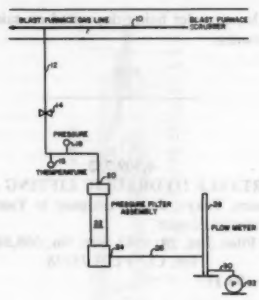
OFF-GAS MONITOR FOR STEEL PROCESSES

Kevin M. Davis; Timothy M. Wahl, both of Rochester; John A. Beckman, and Karl J. Isele, Jr., both of Canton, all of Mich., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed May 23, 1983, Ser. No. 497,360

Int. Cl.³ C21B 7/22

U.S. Cl. 266—44 **1 Claim**



1. A method for determining the efficiency of chemical treatments used in gas scrubbers in steel mill furnace off-gas systems which comprises the steps of:

(a) withdrawing a side stream sample from untreated gas flowing through an off-gas line;

(b) passing said sample through a pressure filter for a fixed period of time at a constant flow rate whereby the particulate matter in the sample is collected,

(c) withdrawing a side stream sample from the same off-gas line after chemical treatment has been added to the off-gas and passing the treated sample through a pressure filter at the same constant flow rate and for the same fixed period of time used in step (b), whereby the particulate matter in the treated matter is collected,

(d) comparing the amount and types of samples collected in steps (b) and (c) to determine the efficiency of the treatment.

4,509,728

MOLTEN METAL FILTRATION INDICATOR

Frank M. Powers, and Robert H. Ogletree, both of Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Oct. 12, 1983, Ser. No. 541,214

Int. Cl.³ C22B 9/00

U.S. Cl. 266—44 **1 Claim**

1. A method of detecting the effectiveness of a molten metal filter in a molten metal tundish of the type having a first chamber for molten metal, a second chamber for molten metal, and a molten metal filter means disposed between said first and second chambers for filtering molten metal between said chambers, including the steps of:

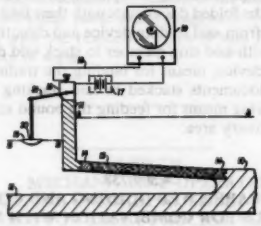
pouring molten metal into the first chamber;

filtering said molten metal from the first chamber into the second chamber through said filter means;

sensing the level of molten metal in one of said chambers;

converting the sensed molten metal level into a signal;

monitoring said level signal as a function of time to detect the rate of change of the level of molten metal; and



determining the effectiveness of said filter means based on the rate of change of the level of molten metal.

4,509,729

HOT ISOSTATIC PRESSING APPARATUS

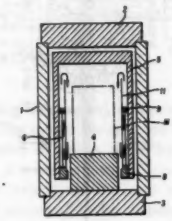
Yoichi Inoue, Hyogo, Japan, assignor to Kabushiki Kaisha Kōbe Seiko Sho, Kobe, Japan

Filed Oct. 26, 1983, Ser. No. 545,516

Claims priority, application Japan, Oct. 29, 1982, 57-165347[U]

Int. Cl.³ F27B *5/04*

U.S. Cl. 266—252 **5 Claims**



1. A hot isostatic pressing apparatus comprising:

(a) a cylindrical pressure vessel comprising a pressure cylinder and a lower lid;

(b) a cup-shaped, downwardly open heat-insulating layer disposed within said pressure cylinder so as to define a first intercylindrical flow passage between the inner surface of said cylindrical pressure cylinder and the outer surface of said cup-shaped heat-insulating layer, the bottom edge of said cup-shaped, downwardly open heat-insulating layer being spaced above said lower lid;

(c) a ring-shaped electrical insulator projecting inwardly from the inner surface of said cup-shaped heat-insulating layer in a low temperature zone near the bottom of said pressure vessel;

(d) a heating unit of the cylindrical, self-standing, single-stage type mounted on said electrical insulator and extending upwardly therefrom, said cylindrical heating unit being disposed within said cup-shaped heat-insulating layer so as to define a second intercylindrical flow passage between the inner surface of said cup-shaped heat-insulating layer and the outer surface of said cylindrical heating unit;

(e) a convection-promoting cylinder mounted on said electrical insulator and extending upwardly therefrom beyond the uppermost portion of said cylindrical heating unit, said convection-promoting cylinder having radial gas flow passages through the lower portion thereof and being disposed within said cylindrical heating unit so as to define a third intercylindrical flow passage between the inner surface of said cylindrical heating unit and the outer surface of said convection-promoting cylinder and a fourth intercylindrical flow passage between the inner surface of said cup-shaped heat-insulating layer and the outer surface of said convection-promoting cylinder; and

(f) a table upon which the material being pressed is supported during use of the hot isostatic pressing apparatus, said table having an upper material supporting surface which is above the radial gas flow passages in said convection-promoting cylinder, said table being disposed within said convection-promoting cylinder so as to define a fifth intercylindrical flow passage between the inner surface of said convection-promoting cylinder and the outer surface of said table,

whereby, when the hot isostatic pressing apparatus is in use, the gaseous pressure medium is caused to convect downwardly along the outer surface of the material being pressed, which material is disposed within said convection-promoting cylinder on top of said table, downwardly in said fifth intercylindrical flow passage, radially outwardly through said radial gas flow passages in said convection-promoting cylinder, upwardly in said second and third intercylindrical flow passages, during which passage it is heated by said cylindrical heating unit, after which it continues upwardly in said fourth intercylindrical flow passage, passes over the top of said convection-promoting cylinder, and once again is caused to convect downwardly along the outer surface of the material being pressed, said convection-promoting cylinder serving to substantially eliminate the temperature difference in the vertical direction in the treatment volume inside said convection-promoting cylinder even though said cylindrical heating unit is short relative to the height of the treatment volume.

4,509,730

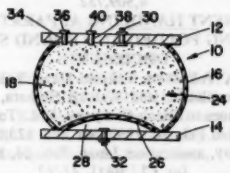
FLEXIBLE WALL SPRING DAMPER

Emile M. Shtarkman, Euclid, Ohio, assignor to Imperial Clevite Inc., Glenview, Ill.

Filed Oct. 25, 1982, Ser. No. 436,330

Int. Cl.³ F16F *13/00*

U.S. Cl. 267—35 **15 Claims**



1. A flexible wall spring damper including opposed first and second rigid mounting members interconnected by a flexible side wall for defining a flexible wall spring damper chamber, a plurality of solid essentially incompressible in volume irregular shaped elastomeric particles included in said damper chamber, said plurality of elastomeric particles having particle sizes of 30 mesh or smaller filling said chamber at least to the point wherein under static load said chamber is essentially filled, and a flexible diaphragm connected to said second rigid mounting member, a selectively pressurizable gas chamber is interposed between said second rigid mounting member and said diaphragm, whereby relative movement between said opposed rigid mounting members operates to stress said flexible side wall, vary the volume of said gas chamber, and cause relative interaction between the solid incompressible individual particles thus promoting the desired damping and spring characteristics.

4,509,731

WORKBENCH WITH REMOVABLE VISE

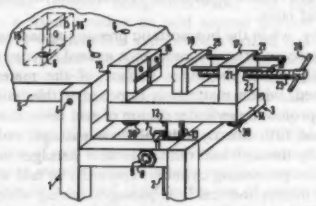
Günter Schaal, and Heribert Schramm, both of Stuttgart, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 15, 1983, Ser. No. 504,473

Claims priority, application Fed. Rep. of Germany, Jun. 18, 1982, 3222750

Int. Cl.³ B25B *1/10*

U.S. Cl. 269—78 9 Claims



1. Workbench having a removable vise (3), a seat cavity for rotary mounting of said vise, and a workplate (5) separate from said vise provided with apertures for seating clamp elements, said workbench comprising the improvements wherein:

said removable vise (3) comprises a vise base (14) having apertures (27) corresponding in their dimensions to said apertures (6) of said workplate (5) and a downwardly extending mandrel (13) for rotary mounting of said removable vise, a first jaw assembly (15,16) with a fixed jaw (16), a second jaw assembly (17,18) with an adjustable jaw (18) and means (28-30) for fastening said jaw assemblies selectively either to said vise base (14) or to said workplate (15) and for detaching said jaw assemblies therefrom, said fastening and detaching means including elements of elongated configuration suitable for passing respectively through said apertures of said vise base or of said work plate, for grasping said jaw assemblies at one end of said elongated configuration and for manual fastening or detaching actuation at the other end of said configuration.

4,509,732

DOCUMENT HANDLING APPARATUS FOR PRODUCING FOLDED AND BOUND STACKS OF DOCUMENTS

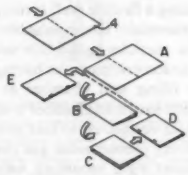
Tadaaki Kanno, Yokosuka; Takeshi Ukai, Yokohama; Yutaka Akahoshi, Funabashi, and Katsuji Shibata, Kiyose, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Feb. 20, 1980, Ser. No. 123,007

Claims priority, application Japan, Feb. 24, 1979, 54-21245

Int. Cl.³ B41L *43/12*

U.S. Cl. 270—37 13 Claims



1. A document handling device for producing bound stacks of documents received from a machine such as a printing machine, a copying machine or the like; comprising a first conveying means for conveying documents received from said machine to a handling section; said handling section including a folding device for folding each received document along a line, a stacking device located at a level beneath that of said folding device and including a stop member, means for sequentially feeding the folded documents with their fold lines as their leading edges from said folding device and directing them into engagement with said stop member to stack said documents in said stacking device, means for binding the trailing edge portions of the documents stacked in said stacking device, and second conveying means for feeding the bound stack of documents to a delivery area.

4,509,733

MULTIPLE PAPER WEB GUIDING AND COMBINING APPARATUS FOR COMBINATION WITH ROTARY PRINTING MACHINE AND FOLDING DEVICE

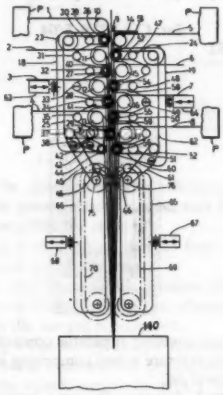
August Pflaum, and Albert Mayer, both of Augsburg, Fed. Rep. of Germany, assignors to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Filed Mar. 6, 1984, Ser. No. 586,690

Claims priority, application Fed. Rep. of Germany, Mar. 8, 1983, 3308069

Int. Cl.³ B41L *43/04*

U.S. Cl. 270—41 13 Claims



1. For combination with a rotary printing machine (P) and paper handling apparatus (140),

a paper web guiding, transporting and combining apparatus having

a frame (20, 21, 22, 18, 19);

and comprising, in accordance with the invention,

a first set of vertically positioned, spaced deflection rollers (10–13; 85–88) positioned to receive a first plurality of paper webs (1–4; 77–80), and deflecting the webs for travel in a vertical direction, and for guiding the webs into a vertically positioned combining plane extending at least approximately tangentially to said rollers, and towards said paper handling apparatus (140);

a second set of vertically positioned spaced deflection rollers (14–17; 89–92) positioned to receive a second plurality of paper webs (5–8, 81–84) from a direction opposite the first direction, and deflecting said paper webs for travel in a vertical direction and into said combining plane, parallel to and adjacent said first plurality of webs and towards said paper-handling apparatus,

the rollers of the second set of rollers being vertically staggered or offset with respect to the rollers of the first set;

and transport means (26–29, 53–56; 110–113, 128–130) located outside of the combining plane (9) at both sides thereof, movable toward and away from the combining plane to permit threading of the respective plurality of

webs about the respective deflection rollers while the transport means are located away from the combining plane, and subsequent movement of the transport means to the combining plane and engagement of the transport means with the respective webs of said first and second plurality of webs.

4,509,734

MECHANICALLY-OPERATED MAGAZINE-UNLOADING, SHEET-FEEDING MECHANISM FOR SHEET PROCESSING APPARATUS

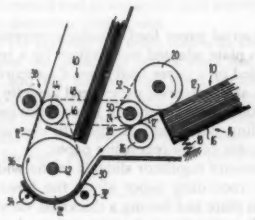
Albert Rutishauser, Rütihofstrasse 38-40, 8713 Uerikon, Switzerland

Filed Apr. 27, 1982, Ser. No. 372,373

Claims priority, application Switzerland, Jul. 30, 1981, 4941/81

Int. Cl.³ B65H 7/02

U.S. Cl. 271—10 **11 Claims**



1. A sheet feeding mechanism, comprising:

a driven separating means constructed and arranged to convey a succession of sheets, sheet by sheet, from a stack along a path, towards a sheet processing station;

a sensing lever extending into said path and being constructed and arranged to be displaced by contact with each sheet;

a spring-operated accumulator; a catch arrangement constructed and arranged to releasably block said accumulator; and a resetting device constructed and arranged for loading said accumulator; said spring-operated accumulator being constructed and arranged when blocked to permit sheets to pass along said path towards said sheet processing station, and when unblocked, to interrupt passage of sheets along said path towards said sheet processing station;

a drive means for said sheet processing station;

a coupling disengagably drivingly connecting said drive means with said driven separating means so that when said coupling is engaged, said drive means for said sheet processing station also drives said driven separating means;

said sensing lever being constructed and arranged to operate said catch arrangement and said catch arrangement being connected with said coupling, for disengaging drive means from said driven separating means by unblocking said accumulator, so that conveying of sheets from said stack into said path is interrupted; and

said resetting device being operatively connected with said drive means to be rotated by said drive means as said drive means is operated;

a second spring-operated accumulator constructed and arranged for re-engaging said coupling; said resetting device being connected with said second spring-operated accumulator for recharging said second spring-operated accumulator each time after said second spring-operated accumulator has re-engaged said coupling.

4,509,735

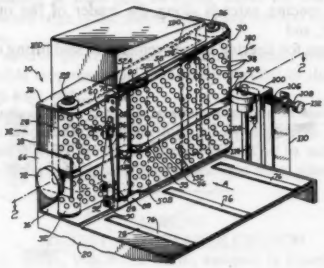
VARIABLE WIDTH ENVELOPE FEEDER

Jerry J. Kosner, LaGrange, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jul. 26, 1982, Ser. No. 401,577

Int. Cl.³ B65H 5/08

U.S. Cl. 271—11 **13 Claims**



1. In a sheet feeding apparatus for feeding vertically disposed sheet material from a horizontally extending stack comprising a platform adapted to support a stack of sheet material, vertically extending frame means disposed at one end of said platform, first and second roller means vertically supported in spaced relation by said frame means, endless web means extending around and driven by said first and second roller means, said web means including a plurality of perforations therein and having one run facing said platform, said one run providing an effective contact surface to engage the first article in said stack of sheet material whereby said first article is transported from said stack of sheet material as said endless web is driven, and adjusting means associated with said frame to vary the effective contact surface of said endless web means by driving said run of said endless web means facing said platform in two spaced apart planes, the effective contact surface of said web means being adjusted by varying the length of said planes by said adjusting means, whereby the effective contact surface of the web is adjusted to prevent corners of the sheet material from becoming caught by the perforations in said web.

4,509,736

APPARATUS FOR MANIPULATING STACKED X-RAY SHEETS OR THE LIKE

Werner Stahl, Kirchheim-Heimstetten, and Jürgen Müller, Munich, both of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 18, 1983, Ser. No. 476,588

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211609

Int. Cl.³ B65H 5/08

U.S. Cl. 271—11 **39 Claims**

1. Apparatus for transferring sheets, particularly X-ray films, from a stack of overlapping sheets to an inlet of a transporting device which accepts the sheets in a first plane, each sheet including a leader having one of a plurality of widths greater than or equal to a minimum width, and each sheet also including an edge which extends transversely of the leader, said apparatus comprising:

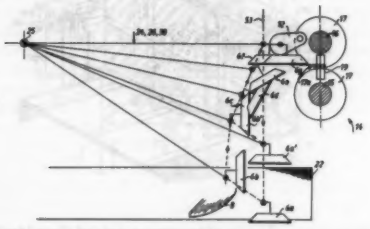
(a) a source of sheets arranged to support the stack so that the outermost sheet is located in a second plane which is at least substantially parallel to said first plane, said source being further arranged to support the stack such that the leaders are substantially superimposed and the edges are substantially in alignment;

(b) a singularizing device including a pair of suction-

operated, mobile lifting elements separated from one another in a predetermined direction by a spacing which at most equals said minimum width, said singularizing device being devoid of lifting elements to the outside of said pair as considered along said predetermined direction;

(c) means for moving said lifting elements into engagement with the leader of the outermost sheet so that one of said lifting elements is in the region of the respective edge and said spacing extends along the leader of the outermost sheet; and

(d) means for steering the movements of said lifting elements



between a first end position in which the latter engage the leader of the outermost sheet in said second plane, and a second end position adjacent to said inlet in which the leader is located substantially in said first plane, said steering means being designed such that said lifting elements bend at least a portion of the leader out of parallelism with said planes as said lifting elements begin to move from said first end position towards said second end position, and said steering means being further designed such that said lifting elements maintain the bent portion of the leader out of parallelism with said planes until arrival of said lifting elements at said second end position.

4,509,737

SHEET FEEDING MEANS

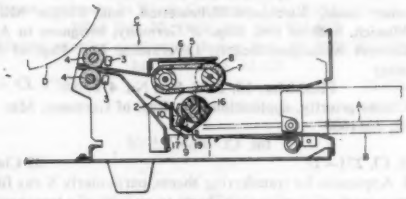
Takao Shiozawa, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1982, Ser. No. 411,540

Claims priority, application Japan, Aug. 29, 1981, 56-128522[U]

Int. Cl.³ B65H *3/52*

U.S. Cl. 271—125 **6 Claims**



1. A sheet feeding means comprising a sheet feeding member for feeding a sheet from a sheet feeding cassette, a transporting member for transporting said sheet fed by said sheet feeding member, a sheet double feeding prevention member movable into contact with said transporting member for preventing double feeding of another sheet with said sheet, a swing member for supporting said sheet double feeding prevention member swingable to an operative position, a movable fitting member for positioning the swing member at said operative position so that it can be adjusted relatively to said transporting member, and a locking member attached to the fitting member for locking said swing member in the operative position during an adjustment operation.

4,509,738

UNIVERSAL PAPER FEED CASSETTE

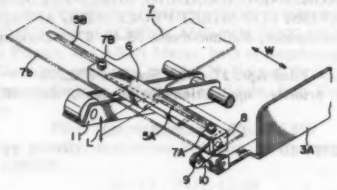
Naoki Aoki, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 525,936

Claims priority, application Japan, Aug. 31, 1982, 57-151318

Int. Cl.³ B65H *3/04, 3/46*

U.S. Cl. 271—160 **2 Claims**



1. A universal paper feed cassette comprising:

a bottom plate adapted to be raised by a spring lift member provided on a paper feed base of a recording apparatus to which said universal paper feed cassette is set;

a restriction plate slidable in the widthwise direction of the recording paper and adapted to restrict the widthwise movement of the recording paper;

paper-pressure regulator slidable in the widthwise direction of the recording paper along the inner surface of said bottom plate and having a thickness varying in the widthwise direction thereof, said regulator being linked to said restriction plate, and said bottom plate being thereby raised by said spring lift member via said regulator.

4,509,739

APPARATUS FOR STACKING LETTER MAIL

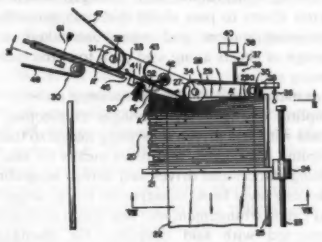
Koji Kurokawa, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Sep. 28, 1982, Ser. No. 426,134

Claims priority, application Japan, Oct. 26, 1981, 56-171007

Int. Cl.³ B65H *43/00, 29/44*

U.S. Cl. 271—176 **14 Claims**



1. An apparatus for stacking letter mail side by side in the upright state in a stacking position in a stacking section, said apparatus comprising:

a letter mail supply path extending toward said stacking section through which the letter mail is supplied;

letter mail supply means for supplying pieces of letter mail one by one in the upright state through said letter mail supply path;

letter mail supporting means provided with a surface for supporting the bottom of the letter mail stacked in said stacking section on the surface;

holding means connected to said letter mail supply path for holding the stacked letter mail, and including a forcible feeding means for engaging the forward end portion of each piece of the letter mail supplied from said letter mail supply path and for forcibly feeding said piece to the stacking position, and urging means for urging a rear end portion of the piece of the letter mail; and

a movable back-up means facing said holding means for co-operating with said holding means to sandwich the stacked letter mail between said holding means and movable back-up means,

said urging means including

a lever means which is pivotally supported on the holding means side of the supply path, and movable between an advanced position in which the free end of the lever is located in the stacking section and capable of pushing the rear end portion of the letter mail against the movable back-up means, and a retracted position in which said lever means is separated from the supply path such that the next piece of the letter mail can be supplied along the supply path,

detecting means provided along the supply path at a location upstream of said lever means with respect to the feeding direction of the letter mail, said detecting means for detecting the forward end of the letter mail which has passed through the detecting means, and

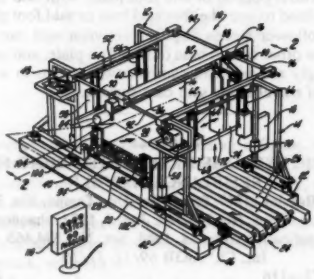
driving means for keeping the lever means in the advanced position when the detecting means does not detect the letter mail, and for moving the lever means from the advanced position to the retracted position during a given time until the forward end of the piece of the letter mail passes beyond the lever means when the detecting means detects the forward end portion of the piece of the letter mail.

4,509,740

SHEET STACKING SYSTEM

Anthony Foresi, and Peter Naysmith, both of Allen Park, Mich., assignors to Anthony Foresi & Associates, Inc., Allen Park, Mich.

Filed Jan. 10, 1983, Ser. No. 457,094
Int. Cl.³ B65H *31/20*
U.S. Cl. 271—224 **7 Claims**



1. A system for stacking sheets of material onto a pallet comprising:

a conveyor arranged for movement along a longitudinal axis and adapted to support a pallet onto which sheets are successively fed in a direction substantially normal to said longitudinal axis to form a stack of sheets on the pallet;

a pair of side gates extending transversely across the conveyor on opposite sides of, and equidistant from, a central stacking axis extending transversely across the conveyor in general alignment with the feed direction of the sheets;

first motive power means for automatically moving said side gates oppositely and in unison in directions normal to said central stacking area axis to vary the spacing between said gates while maintaining their equidistant relationship to said central stacking area axis;

second motive power means for automatically lifting the gates up from the conveyor to allow the conveyor to move a pallet into and out of the stacking area;

rigid stop means located at the sheet entry end of the stacking area;

flexible stop means at the opposite end of the stacking area including at least one swinging panel for contacting a forward edge of the sheets as they are fed into the stacking area;

third motive power means for automatically moving said flexible stop means in a direction parallel to the stacking area axis; and,

controller means for selectively energizing at least the first and third motive power means to position the gates and flexible stop means at desired positions to substantially conform the stacking area to various sheet sizes.

4,509,741

HEIGHT ADJUSTABLE CRUTCH

Alfred A. Smith, Van Nuys, Calif., assignor to Guardian Products Company, Inc., Simi Valley, Calif.

Filed Jan. 3, 1983, Ser. No. 454,985
Int. Cl.³ A61H *3/02*
U.S. Cl. 272—69 **5 Claims**

1. A height adjustable crutch comprising:

(a) a bow having a transverse arm crutch support and a pair of vertical hollow tubular members extending down-

wardly from said support, said members being brought into closer but spaced apart parallel alignment for a predetermined distance from their lower extremities and maintained in their hollow tubular condition

(b) a hollow tubular carrier, said carrier being disposed in the space between the lower extremities of said hollow tubular vertical members and in abutment therewith, said carrier being orificed at spaced intervals along at least one of its sides not in abutment with said lower extremities of said hollow tubular vertical members;

(c) first means securing the upper end of said carrier to each of said vertical members;

(d) second means securing the lower end of said carrier to each of said vertical members, said second means comprising an element encompassing externally each of said lower extremities of said vertical members and the carrier therebetween and secured externally at diametrically opposite points of contact to each of said extremities to prevent axial movement of said element relative to each said extremity; and

(e) a telescoping foot member disposed for axial displacement within and relative to said carrier, said foot member being provided with at least one laterally projecting detent, said detent being spring-biased radially outwardly for projection through any of the orifices at spaced intervals along said carrier whereby, when said detent is so projected through any such orifice, the foot member is locked against telescoping movement relative to said carrier, but such movement may be effected by pressing the spring-biased detent radially inwardly thereby to change the disposition of the foot member relative to the carrier, for locking engagement at such changed disposition by projection of the detent outwardly through a different orifice in said carrier.

4,509,742

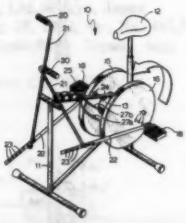
EXERCISE BICYCLE

Charles F. Cones, 124 S. Market St., Thorntown, Ind. 46071

Filed Jun. 6, 1983, Ser. No. 501,634

Int. Cl.³ A63B *23/04, 21/00*

U.S. Cl. 272—73 **10 Claims**



1. An exercise bicycle, comprising:

a frame;

a positive displacement hydraulic pump mounted on said frame, said pump having a pair of inlet/outlet passages and a driveshaft for operating said pump;

a pair of foot pedals connected to said driveshaft of said pump for rotating said driveshaft;

a load resistance control means operatively connected to said pump for selectively controlling the load resistance on said hydraulic pump and automatically maintaining said load resistance constant at varying speeds of said driveshaft, said control means defining a valve body and valve seat in flow communication with said inlet/outlet passages; and

a hydraulic pressure gauge means in fluid communication with said pump and said load resistance control means, said hydraulic pressure gauge means serving to indicate work rate input of an operator actuating said exercise bicycle.

4,509,743

BALANCE TRAINING APPARATUS

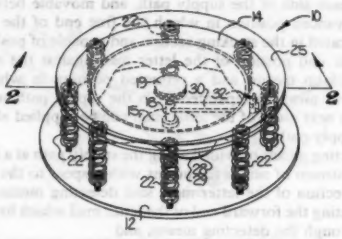
Hakon Lie, Oslo, Norway, assignor to Chatanooga Corporation, Chattanooga, Tenn.

Filed Mar. 7, 1983, Ser. No. 472,678

Claims priority, application Norway, Mar. 10, 1982, 820780

Int. Cl.³ A63B *23/04, 69/18*

U.S. Cl. 272—97 **10 Claims**



1. An apparatus for the balance training of athletes, and which is particularly adapted for use in training for downhill skiing, and comprising

a base adapted to rest upon a horizontal supporting surface,

a foot plate upon which the athlete is adapted to stand,

means supporting said foot plate in spaced relation above said base, said supporting means including resilient means joining said base and foot plate and disposed in a generally circular arrangement around the central portion of the foot plate, and

drive means for imparting continuous irregular tilting movement of said foot plate relative to said base, whereby an athlete standing upon said foot plate is required to continuously adjust to the changing inclination of the foot plate, said drive means including a circular cam plate defining an irregularly undulating cam surface which is disposed between said base and said foot plate and coaxially about said central portion of said foot plate, with said cam plate being fixed to one of either said base or said foot plate, and cam follower means disposed between said cam surface and the other of said base or said foot plate, and means for drivingly moving said cam follower means in a circular path of travel along said cam surface.

4,509,744

AQUATIC EXERCISE DEVICE WITH RIGID FLUID RESISTANCE MEMBER

Robert L. Beasley, 1217 Terra Mar Dr., Tampa, Fla. 33612

Continuation of Ser. No. 384,720, Jun. 3, 1982, abandoned. This application Mar. 28, 1984, Ser. No. 594,463

Int. Cl.³ A63B *69/12, 31/10*

U.S. Cl. 272—116 **9 Claims**

1. An aquatic exercise device for use in a swimming pool or the like comprising a rigid fluid resistance member including a substantially planar inner portion having a wrist guide extending outwardly from the periphery of said substantially planar inner portion and a hand grip held in fixed spaced relation relative to said substantially planar inner portion by a pair of interconnecting members, said wrist guide comprising a wrist stabilizing member extending outwardly from said rigid fluid resistance member to engage the user's wrist, said wrist stabilizing member comprising a substantially U-shaped member, the legs of said U-shaped member extending substantially parallel to the plane defined by said planar inner portion of said rigid fluid resistance member and also to said hand grip to engage opposite sides of the user's wrist joint to retain the

user's wrist rigidly therein such that the user grasps said hand grip while placing his wrist within said wrist guide to prevent

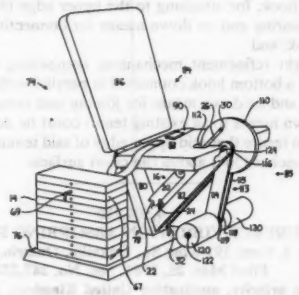
flexure and extension of the user's wrist as the user moves said aquatic exercise device through the water creating a resistance on said rigid fluid resistance member to exercise the user.

4,509,745

WEIGHT LIFTING DEVICE

Gregory S. Angsten, 151 South St., Crystal Lake, Ill. 60014

Filed Jun. 18, 1982, Ser. No. 389,719
Int. Cl.[3] A63B 21/00
U.S. Cl. 272—130 7 Claims



1. A weight lifting device comprising a frame, said frame having secured thereto, a variable weight stack, a force applicator means for moving said variable weight stack, a connecting means for operably connecting said force applicator means to said variable weight stack so that movement of said force applicator means causes movement of a selected portion of said variable stack, wherein:

(a) said force applicator means is acted upon by a user during exercise of one or more groups of muscles;

(b) said variable weight stack includes a first weight and a second weight, said second weight adjustable and removable attachable to said first weight, said first weight is operably and directly connected to said connecting means:

(c) a hydraulic connector forming a part of the connecting means and comprises a hydraulic cylinder operatively connected to said weight stack; and

(d) said connecting means including a hydraulic connecting means being connected at one end to said variable weight stack and at the other end to said force applicator means to thereby form a closed hydraulic circuit.

4,509,746

ARTICULATED EXERCISE BENCH WITH LEG CURL DEVICE

Ernest D. Mask, 311 Marion La., Lee's Summit, Mo. 64063

Filed Jul. 19, 1983, Ser. No. 515,305
Int. Cl.[3] A63B 21/00
U.S. Cl. 272—134 9 Claims

9. An exercise device adjustable for exercising the legs in either a sitting or prone position, said device comprising:

a frame including an elongated, floor-engaging base and three elongated, spaced-apart, upright, approximately coplanar first, middle, and last members affixed to said base;

an exercise unit presenting a pair of elongated first elements fixedly interconnected to each other adjacent one end thereof in oblique orientation, a pair of elongated second elements respectively transversely affixed to a corresponding first element adjacent the other end thereof, said unit being pivotally interconnected to said first, upright member adjacent the upperend thereof, and said unit including weight-receiving structure for varying the resistance of said unit to pivoting;

an elongated bench having a flattened, first portion pivotally secured at one end thereof to said first upright member in close proximity to said pivotal interconnection of said unit to said first member, and said bench having an elongated, flattened second portion hingedly interconnected at one end thereof to said other end of said first portion, and said second portion other end including means for securing said second portion to the upper end of said last upright member,

means for alternately securing said bench in first and second positions wherein in said first position said first and second portions are oriented substantially perpendicular to each other and said second portion abuts said frame middle member, and in said second position wherein said bench is upwardly oriented along the hinged interconnection between said first and second portions thereby presenting a gabled configuration and said bench is supported at one end by said pivotal securement to said first member, said alternate securement means comprising said apart structures carried by said bench for engaging a plurality of said elongated, spaced-apart, upright members.

4,509,747

ARM WRESTLING APPARATUS

Michael L. Martin, Canyon, Tex., assignor to Martin Research & Development, Canyon, Tex.

Filed Jul. 18, 1983, Ser. No. 514,463
Int. Cl.[3] A63B 21/00, 21/16
U.S. Cl. 272—136 9 Claims

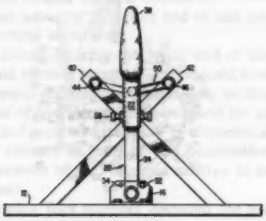
1. An arm wrestling apparatus, comprising:

a base;

a pivoting arm pivoted at one end to said base;

resilient force means attached to a first point on said pivoting arm and to a second and stationary point for stretching to provide an opposing force that increases as the distance between said first and second point increases;

a first longitudinal reinforcing member disposed in a plane at right angles to said base with said second point disposed thereon along the longitudinal axis thereof, said first member forming an acute angle with respect to the surface of said base such that the force resulting from pivoting of said arm is primarily directed along the longitudinal axis thereof, said first member essentially oriented along the cord of the arcuate path traversed by said first point and providing maximum reinforcement therealong such that



the opposing force vector resulting from said opposing force is essentially directed along the longitudinal axis of said first member when said pivoting arm is proximate its maximum rotation; and

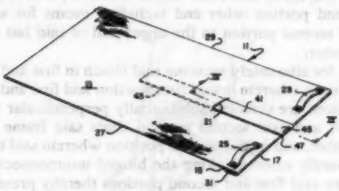
a second longitudinal reinforcing member attached to said first member at an essentially right angle thereto for reinforcing said first member against force vectors directed off axis to said first member that results from said pivoting arm not being proximate its maximum rotation.

4,509,748

FOOT HOLDING APPARATUS FOR SIT-UPS AND LIKE EXERCISES

Michael J. Bezak, 5203 First St., Versailles Boro, Pittsburgh, Pa. 15132

Filed Jul. 5, 1983, Ser. No. 510,902
Int. Cl.³ A63B *23/02*
U.S. Cl. 272—145 **8 Claims**



1. A foot holding apparatus for performing sit-ups and like exercises comprising:

(a) a rectangular mat adapted to lie flat in a substantially horizontal plane when placed on a generally flat supporting surface, said mat having a first sleeve portion therein extending across the width of the mat near one end thereof and presenting an uppwer sleeve surface, said mat also having a pair of spaced-apart foot holding means attached to the upper sleeve surface;

(b) a generally rectangular flat cross bar member having a single top and a single bottom surface, said member having a relative narrow width and thin thickness with respect to a length dimension thereof, said cross member adapted to lie flat in a substantially horizontal plane and to be inserted into the sleeve; and

(c) a separate generally rectangular substantially flat elongated member having a single top and a single bottom surface, said elongated member having a relatively narrow width and thin thickness with respect to a length dimension thereof, said elongated member adapted to lie flat in a substantially horizontal plane and to be positioned over said cross member in a manner whereby at least a portion of one end of said elongated member engages the top surface of the cross bar at the approximate midpoint of the cross bar and an opposite end of the elongated member extends away from the sleeve and is positioned under the mat and upward movement of the sleeve portion of the mat and attached foot holding means is resisted by the mass of a user applied through the mat to the opposite end of the elongated member.

4,509,749

TENNIS NET TIE DOWN AND HEIGHT MEASUREMENT DEVICE

Philip I. Robinson, 23608 Clover Trail, Calabasas, Calif. 91302

Filed Dec. 10, 1979, Ser. No. 101,414
Int. Cl.³ A63B *61/00*
U.S. Cl. 273—29 BA **1 Claim**

1. A tennis net tie down and height setting device, comprising:

a top hook, for attaching to the upper edge of a tennis net;

a measuring and tie down means for connecting to said top hook; and

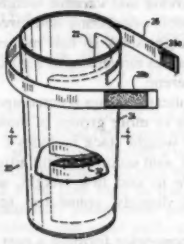
a height refinement mechanism, comprising a turnbuckle and a bottom hook connected in parallel with said measuring and tie down means for joining said measuring and tie down means to an existing tennis court tie down fitting so as to insure that said upper edge of said tennis net is thirty-six inches (36") above the court surface.

4,509,750

SURFACE VIBRATION ABSORBING STRAP

Anthony J. Last, 191 King St., Oakville, Ontario, Canada

Filed Mar. 25, 1981, Ser. No. 247,258
Claims priority, application United Kingdom, Apr. 9, 1980, 8011688
Int. Cl.³ A63B *69/38*
U.S. Cl. 273—29A **8 Claims**



1. A device for treating epicondylalgia externa, which comprises:

pad means containing vibration-absorbing high viscosity permanently-fluid material dimensioned to extend over an area of the forearm of a wearer of the device which is at

least half of the area of the extensor or flexor muscles in the forearm projected to the forearm surface,

said high viscosity permanently-fluid material being a high viscosity liquid which is selected from the group consisting of liquid silicones and liquid uncured thermal setting glues, and

a forearm-encircling tubular member contoured to fit over a forearm and having said pad means mounted to an internal surface theroef, whereby said pad means may be maintained in contact with the forearm, said tubular member comprising a conical sleeve constructed of a fabric which is stretchable only in the circumferential direction of said tubular member.

4,509,751

GOLFER'S WIND INDICATOR AND BALL RETRIEVER

Michael A. Tabet, 1302 Pamela Pl., Norfolk, Va. 23513

Filed Mar. 23, 1983, Ser. No. 477,937

Int. Cl.³ A63B *69/36, 57/00;* **G01F** *15/00;* **B66F** *11/00*

U.S. Cl. 273—32 H **1 Claim**

1. A combination golf ball retriever and wind indicator comprising:

(a) an extensible and collapsible telescoping rod member;

(b) a handle on one end of the rod member;

(c) a wind sock and golf ball retrieving member on the other end of the rod member, the wind sock and golf ball retrieving member including an annular wind opening, a rigid guide for the annular wind opening and a wind outlet smaller than the opening, the opening and outlet connected by an annular sock of substantially solid fabric material, the sock diminishing in diameter from the opening to the outlet, the opening being of a diameter larger than a golf ball to allow passage of a golf ball therethrough, and the outlet being of a diameter smaller than a golf ball to prevent passage of a golf ball therethrough; and

(d) means for enabling said wind sock and golf ball retrieving member to be rotated, relative to the handle, by the force of the wind,

wherein the sock, rod and handle may function as a wind sock and as a golf ball retriever, the combination golf ball retriever and wind indicator being compact, portable and easily carried by a golfer when collapsed.

4,509,752

RETURNED BOWLING BALL LIFTING APPARATUS

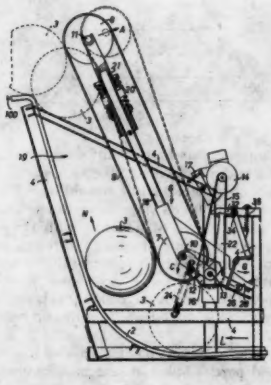
August Schmid, Schwerzenbach, Switzerland, assignor to Patentverwertungs-u, Finanzierungsgesellschaft Seranta AG, Glarus, Switzerland

Filed Sep. 8, 1983, Ser. No. 530,115

Claims priority, application Switzerland, Sep. 14, 1982, 5441/82

Int. Cl.³ A63D *5/02*

U.S. Cl. 273—49 **15 Claims**



12. Return bowling ball lifting apparatus, for combination with a bowling ball return race or track (2) in which bowling balls (3) are moved towards a playing position (100),

said apparatus including

a ball lift mechanism (6) having

an elongated frame (18, 20, 21),

a pair of rollers (7, 8) positioned on the frame adjacent the end positions thereof,

belt means (9) engageable with a bowling ball (3) to be lifted from the race (20) to an elevated position (100), looped about the rollers (7, 8);

and comprising,

feeler means (30, 62, 130) extending into the path of the bowling ball (3) on the race (2) and sensing presence of the ball (3) at a predetermined unusual position on the race,

wherein the feeler means comprises a feeler lever (30) positioned to be engaged by a ball, the feeler lever being mounted for free pivoting movement upon engagement with a ball operating in ball supplying direction (L), the feeler lever being actuated by the ball when the ball is running on the race or track (2) in reverse direction (P), and actuating the feeler for operating the ball lift mechanism moving means (12, 13, 24, 22, 32, 38),

means (12, 13, 24, 22, 32, 38; 66, 68, 70–98, 38) for permitting moving the entire ball lift mechanism from a first, or normal position in which the lowermost point of the lower roller (7) of the pair (7, 8) is clear of a ball passing therebeneath to a second or lower position,

said moving means being coupled to and controlled by the feeler means and operative to effect said movement upon sensing of a ball at said predetermined position on the race and thereby engage the ball and lift the ball;

and reset means (26, 28) coupled to the ball lift mechanism (6) to return the ball lift mechanism to said first or normal position upon lifting of the ball beyond a predetermined level.

4,509,753

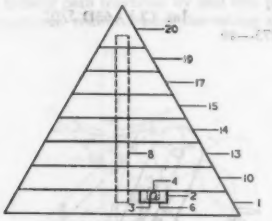
HIDDEN PASSAGE BALL PUZZLE

Philip M. Vaughan, Jr., P.O. Box 925, Woodstock, N.Y. 12498

Filed May 23, 1983, Ser. No. 467,146

Int. Cl.³ A63F 7/04

U.S. Cl. 273—110 **7 Claims**



1. A puzzle game comprising,

(a) a base, a top piece and a plurality of intermediate levels wherein the said intermediate levels are parallel with and rotatable about an axis relative to said base,

(b) said intermediate levels have at least one hole through said level and capable of aligning with the hole of an adjacent level providing a pathway, through the puzzle,

(c) all said intermediate levels except the top level of said intermediate levels, and said base have holes extending into each level but not through said levels and the partial holes being capable of alignment with said holes forming the pathway,

(d) a ball capable of traversing said pathway,

(e) one of said partial holes in said base having means to indicate passage of said ball.

4,509,754

ELECTRIC GAME APPARATUS WITH ROTATING MARKER

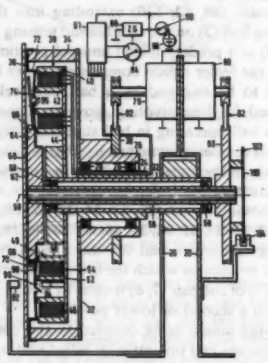
Andreas Remmler, deceased, late of Neu Isenburg, Fed. Rep. of Germany; by Heinz Remmler, heir, and by A. Käthe Remmler, heir, both of An den Grundweisen 65, 6078 Neu Isenburg, Fed. Rep. of Germany

Filed Feb. 24, 1984, Ser. No. 583,412

Claims priority, application Fed. Rep. of Germany, Mar. 11, 1983, 3308618

Int. Cl.³ A63F 5/04

U.S. Cl. 273—142 J **14 Claims**



1. A game apparatus having a frame rotatably mounting a symbol substrate and a marker capable of relative motion by means of an electric motor, with a plurality of teeth fixed with respect to the axis of said symbol substrate about which it is coaxially mounted and with a spatial tooth frequency corresponding to that between the symbols on the symbol substrate, further including an electromagnet means allowing the relative motion between the symbol substrate and the marker and interrupting this motion as a function of a random generator output, the marker and the symbol substrate being mutually lockable in one of several rotational angular positions predetermined by the teeth,

characterized in that the electromagnet means comprises the poles of two annual electromagnets mounted approximately concentrically to each other and coaxially with the axis of the symbol substrate, one electromagnet being located adjacent the teeth and the other electromagnet being located radially therefrom, the marker being a freely moving magnetizable element positioned adjacent but spaced from the poles of the electromagnets, a pair of non-magnetizable rings each mounted between the poles of the electromagnets and the marker and spaced from the electromagnets, one ring being fastened to the symbol sybstrate, the rings being so shaped that the marker rests only against that ring which is next to the actuated electromagnet and means for selectively energizing said electromagnets whereby when the other electromagnet is energized the marker is held against the ring not attached to the symbol substrate and spaced from the teeth of the symbol substrate, and when the one electromagnet is energized, the marker is held against the ring fastened to the symbol substrate and engages in the space between a pair of teeth.

4,509,755

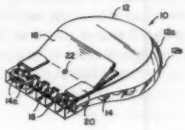
VERSATILE PLURALITY MIXER WITH RAPID CHANCE LOT CYCLING AND LOCKING MEANS

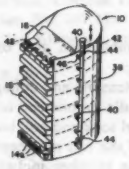
James S. Cheatham, 11 Hunter St., Ossining, N.Y. 10565

Filed May 7, 1984, Ser. No. 607,591

Int. Cl.³ A63F 7/04

U.S. Cl. 273—144 B **2 Claims**





1. A versatile plurality mixer with rapid change lot cycling and locking means which comprises:

(a) a mixing housing masked and fully enclosed having an opaque sloped to half member and a transparent bottom half member affixed to said top half member permitting inspection;

(b) a plurality of multiple marked indicia opaque chance lot spheres placed within said mixing housing;

(c) a single row of transparent cubical cells, each said cell having a top slot therein and said cells interfaced with a side of said mixing housing such that said spheres can enter said cubical cells when said mixing housing is inclined with said cells downward to permit rapid chance lot formation of said spheres and said spheres can exit said cubical cells when said mixing housing is inclined with

said cells upward to permit mixing of said spheres within said mixing housing;

(d) means for locking said spheres simultaneously within said cubical cells for viewing and for unlocking said spheres simultaneously within said cubical cells so that said spheres can enter said mixing housing said means having a bent lock control member having a plurality of downwardly extending fingers, a fastener to hold said lock control member to the top half member of said mixing housing allowing said lock control member to move about said fastener so that all said fingers can move simultaneously in and out of said top slots in said cubical cells, and a resilient flat leaf spring engaging said lock control member to apply a force against said lock control member to normally keep said fingers of said lock control member within said top slots of said cubical cells;

(e) a plate transversely mounted across top of said cubical cells and in front of said top slots to protect said fingers of said lock control member; and

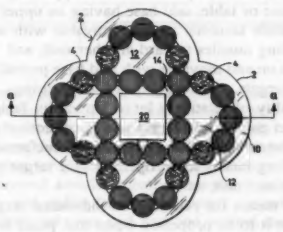
(f) a plurality of perturabators built within the mixing housing which with adequate volume assures that said spheres are forced into random intermixing even during mild mixer agitations, said top half member of said mixing housing having an aperture placed at the rear thereof and a cap for sealing said aperture after said spheres are placed within said mixing housing, said mixing housing further having at least one inner wall to divide said mixing housing into more than one compartment, each connected to a transparent cubical cell with a plurality of said spheres contained within each said compartment determined by intended lottery game in use.

4,509,756

PUZZLE WITH ELEMENTS TRANSFERABLE BETWEEN CLOSED-LOOP PATHS

Ivan Moscovich, 19 Elkachi St., Afek-Ramat Aviv, Israel

Filed Dec. 18, 1981, Ser. No. 332,260
Int. Cl.³ A63F *9/08*
U.S. Cl. 273—153 S **11 Claims**



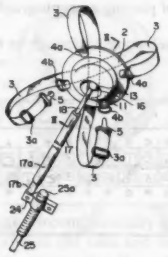
11. A game puzzle comprising: a holder and a plurality of at least two distinguishable kinds of manipulatable elements movable within said holder; said holder defining two closed-loop paths of movement for said manipulatable elements; each of said closed-loop paths being constituted of two essentially straight and essentially parallel sides joined by semicircular ends, the sides of the two closed-loop paths intersecting each other substantially perpendicularly to each other at four intersection points defining the corners of a square; said manipulatable elements filling said two closed-loop paths and being constrained by said holder to move only along one closed-loop path except at the intersection points whereat the elements may be moved along either of said closed-loop paths, thereby permitting an element to be transferred at said intersection points from one closed-loop path to another.

4,509,757

GOLF SWING DIAGNOSING DEVICE

Mitsuho Yuhara, 4-12-25 Kugayama, Suginami-ku, Tokyo, Japan

Filed Jun. 7, 1983, Ser. No. 501,629
Claims priority, application Japan, Jun. 18, 1982, 57-104016
Int. Cl.³ A63B *69/36*
U.S. Cl. 273—186 A **6 Claims**



1. A golf swing diagnosing device comprising:

a base plate;

means for removably supporting said base plate on a part of a person's body so that one side faces said body and the other front side faces outwardly therefrom;

a supporting plate having a front surface removably mounted on said base plate;

a recording plate removably mounted on the front surface of said supporting plate;

an indicating surface of said recording plate;

a cover mounted on said base plate enclosing said recording plate;

a front opening through said cover plate;

a rotary ball member rotatably mounted in said opening;

a pipe shaft extending through and fixedly mounted in said ball member having an inner end between said ball member and said indicating surface, and an outer end extending outwardly from said ball member;

a recording means mounted in said pipe shaft and extending from the inner end thereof in operative engagement with said indicating surface to mark a locus thereon when moved thereover; and

an elongated telescoping arm attached to the outer end of said pipe shaft at one end and having a mounting bracket at the other end, said mounting bracket being adapted to removably connect the grip end of a golf club to said telescoping arm;

so that when the golf clug is swung by the person, the movement thereof is transmitted through said rotary ball member to record corresponding loci on said indicating surface by said recording means indicating the form of the swing.

4,509,758

CRYPTOGRAPHIC GAME APPARATUS AND MODE OF PLAY

Joycene L. Cole, 10875 Kling St., North Hollywood, Calif. 91602

Filed Aug. 16, 1983, Ser. No. 523,425
Int. Cl.³ A63F *9/00, 9/04;* G09C *1/00*
U.S. Cl. 273—240 **6 Claims**

1. Cryptographic game apparatus comprising:

a. an encrypting device for producing chance pairs of alphabetical indicia forming a sample substitution cypher;

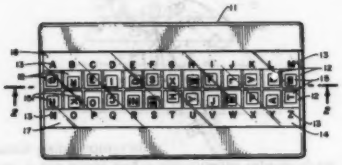
b. a first sheet containing a message to be encrypted employing said pairs of alphabetical indicia; and,

c. a plurality of additional sheets, one for each player, whereupon said players write the encrypted message and attempt to determine the alphabetical pairs to recover the original message, said encrypting device including:

1. a container;
2. a plurality of substantially identical compartments having open tops;
3. alphabetical indicia uniquely identifying each of said compartments;
4. a plurality of markers adapted to fit in said compartments; and,
5. alphabetical indicia uniquely identifying each of said markers.

6. The method of playing a cryptographic game comprising the steps of:

a. a first player selecting a message to be encrypted;



b. said first player manipulating a container having alphabetically labeled compartments and alphabetically labeled markers, whereby each of said markers is randomly placed in one of said alphabetically labeled compartments, thereby forming a simple substitution cypher;

c. said first player notifying other players of the substituted letters forming the encrypted message, together with at least one prearranged clue;

d. said other players in turn attempting to determine the pairs of letters randomly combined by said markers in said compartments; and,

e. providing a time limit for each of said other players to decrypt said encrypted message.

4,509,759

BINGO GAME INVOLVING PROMOTIONAL COUPONS

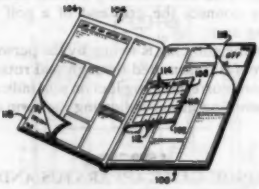
Maynard E. Small, 105 Ward Pkwy., Kansas City, Mo. 64112

Continuation-in-part of Ser. No. 273,259, Jun. 12, 1981, Pat. No. 4,342,457, which is a continuation of Ser. No. 79,189, Sep. 26, 1979, Pat. No. 4,285,520. This application Jun. 7, 1982, Ser. No. 385,840

The portion of the term of this patent subsequent to Aug. 25, 1998, has been disclaimed.

Int. Cl.³ A63F *3/06*

U.S. Cl. 273—269 **2 Claims**



1. A game of the type known as "bingo" for players comprisng:

(a) a single edition printed run-of-press, multi-page and mass circulation publication;

(b) a set of playing cards, one of said set provided with each sample of said publication, each of said cards having a grid with several rows and columns forming a set of oriented areas, each oriented area respectively bearing individual indicia thereon;

(c) a set of coupons common to all players printed in said publication, at least a portion of said coupons being positioned at various isolated locations throughout the pages of the publication as to be spaced apart from one another by printed subject matter unrelated thereto, each coupon respectively bearing individual indicia, whereby every player has an identical set of indicia bearing coupons; at least a portion of said coupons being located on pages separate from said playing card; and

(d) said area indicia and said coupon indicia being cooperatively related, in that selected indicia from the coupon indicia set match with selected indicia from the area indicia set such that said matched area indicia describes a predetermined pattern on said playing card grid; whereby each player is urged to scan each page of said publication to determine the presence of said coupons in order to produce said predetermined pattern of matched indicia.

4,509,760

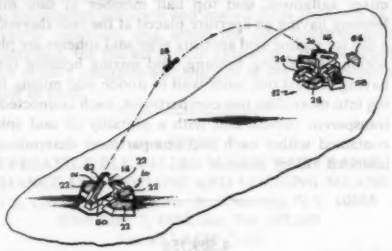
TARGET STRUCTURE

Adolph E. Goldfarb, 1432 SE. Wind Cir., Westlake Village, Calif. 91361, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph E. Goldfarb, Westlake Village, Calif.

Filed May 11, 1983, Ser. No. 493,520

Int. Cl.³ A63F *9/02*

U.S. Cl. 273—380 **11 Claims**



1. A battle simulating game apparatus for two or more players to play a competitive missile shooting game, the apparatus comprising at least two relatively movable combination launcher-target units, one unit for each player, each unit comprising:

(a) a separate base for allowing a player to selectively locate the unit in desired positions on a supporting surface such as a floor or table, said base having an upper surface;

(b) A missile launcher on and movable with said base for propelling missiles toward another unit; and

(c) means on and movable with said base providing a plurality of targets, said target means comprising:

a plurality of relatively large, upwardly facing, separate target panels, said target panels collectively occupying a substantial portion of said upper surface of said base,

propelling means for propelling said target panels away from said unit, and

release means for releasing an individual target panel, to allow it to be propelled when that panel is struck by a missile to simulate an explosive hitting the target while leaving said other target panels on the unit in condition to be propelled only when they are subsequently struck by a missile, so that the players can continue to shoot missiles back and forth even after one or more targets have been hit.

4,509,761

MODEL SHUTTLECOCK

Mau-Fan Liu, No. 28, Alley 2, La. 141, Tung-Ho St., Taipei, Taiwan

Filed Jun. 29, 1983, Ser. No. 509,149

Int. Cl.³ A63B *67/18*

U.S. Cl. 273—417 **5 Claims**

1. A plastic shuttlecock comprising a hemispheric cork and a body of monobloc molded plastic materials; said body being

composed of a shaft ring, a collar, a base seat and stems, which stems extend outwardly from the base seat to form a conical structure; and a tail skirt composed of three portions: an upper skirt connected to the base seat; a lower skirt comprising feather wings extending from opposite sides of the stems and

having air exhaust surfaces and air resistant surfaces, said air exhaust surfaces and air resistant surfaces being angularly connected to each other at one edge and to said feathers, forming an outwardly open V-shape recessed relative to the surface of the tail skirt; and a mid-skirt comprising a plurality of reinforcing circles connected with said stems.

4,509,762

STATIONARY ASSEMBLY FOR MECHANICAL SHAFT SEAL

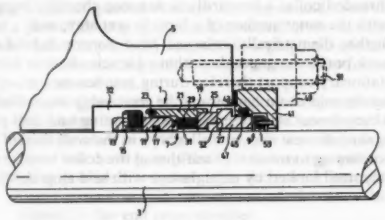
Keith C. Garrett, Shipley, England, assignor to AES Engineering Limited, South Yorkshire, England

Filed Jun. 30, 1983, Ser. No. 509,379

Claims priority, application United Kingdom, Jul. 1, 1982, 8219023

Int. Cl.³ F16J *15/34*

U.S. Cl. 277—81 R **6 Claims**



1. A stationary assembly for a balanced mechanical shaft seal for sealing a rotatable shaft to a fixed housing, said seal including a rotary assembly with a radial face and also including a stationary assembly, the stationary assembly comprising a first annular member for surrounding the shaft and attachable to the housing, a second annular member having a radial face for mating with said radial face of the rotary assembly, a third annular member between said first and second members, and mounting means for permitting relative pivotal movement about a first axis between said first and third members and about a second axis at right angles to the first axis between said second and third members, said pivotal movement between members being without any axial forces being exerted between said members by any spring of the stationary assembly.

4,509,763

RADIALLY EXTENSIBLE JOINT PACKING WITH HELICAL SPRING SUPPORT MEANS

Richard J. Flacher, Aurora, Colo., assignor to The Gates Rubber Company, Denver, Colo.

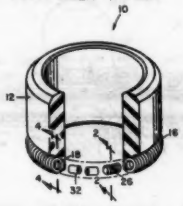
Filed May 2, 1983, Ser. No. 490,649

Int. Cl.³ F16J *15/12*

U.S. Cl. 277—163 **12 Claims**

1. In a joint packing of the type used to seal an annular radial gap and having a generally annularly shaped polymeric core, with two ends, that is radially extensible when externally clamped along a longitudinal axis of the core to seal the annular gap, the improvement comprising:

a core having at least one circumferential groove located next to at least one end; and



a garter type spring circumferentially oriented to and located in the groove of the core and having a helical coil diameter generally greater than the radial gap to be sealed and wherein the groove has a depth that is substantially equal to the helical coil diameter.

4,509,764

SEALING ARRANGEMENT

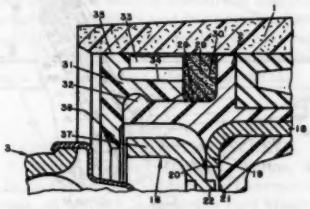
Manfred Brandenstein, Eussenheim; Rüdiger Hans, Niederwerrn, and Heinz Kiener, Waigolshausen, all of Fed. Rep. of Germany, assignors to SKF Kugellagerfabriken GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,292

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1981, 8133054[U]

Int. Cl.³ F16N *1/00*; F16J *15/00*

U.S. Cl. 277—166 **7 Claims**



1. In a sealing arrangement for sealing the space between a cylinder and a piston or the like on the side thereof directed to the pressure space, against dust and dirt particles, the improvement comprising a felt ring or the like having a rectangular cross-section with one side engaging a shoulder of the piston and with another side surface abutting a radial surface of the piston or the like, the felt ring having an outer diameter, which in the noninstalled condition is larger than the outer diameter of the piston or the like, and further comprising a holding ring for the felt ring, the holding ring being connected to the piston, on the side of the felt ring directed away from the radial surface of the piston or the like, the holding ring having a sealing surface engaging the cylinder as well as an annular recess opening toward the bore surface of the cylinder space for forming a dust chamber between the felt ring and sealing surface.

4,509,765

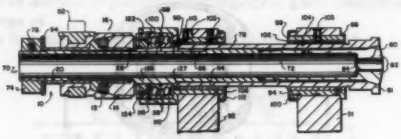
FORCE TRANSMITTING WEDGE STRUCTURE

Florian I. Nowak, 16 Dean Dr., Newington, Conn. 06111

Division of Ser. No. 363,104, Mar. 29, 1982, Pat. No. 4,418,925, which is a continuation-in-part of Ser. No. 312,387, Oct. 19, 1981,. This application Jul. 18, 1983, Ser. No. 514,577

Int. Cl.[3] B23B *31/20*

U.S. Cl. 279—50 8 Claims



1. A solid wedge member adapted for use in a collet-operating mechanism or the like configured as a toroidal section and having a radially outward face with an arcuate bearing surface thereon, and axially spaced forward and rearward faces angularly disposed with respect to one another to provide an inward taper to said member, said faces having compound bearing surfaces thereon, each comprised of an outer zone and a bevelled inner zone with a ridge line at the juncture therebetween, said ridge lines being radially offset from one another, thereby permitting pivotal movement of said member thereabout in contact with bearing surfaces of a collet-operating mechanism.

4,509,766

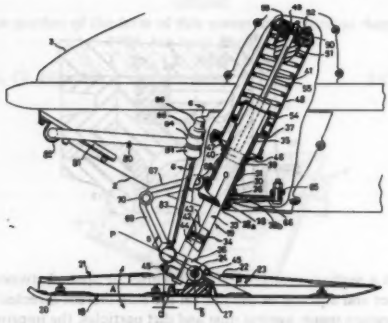
ANTI-ROLLING SYSTEM FOR SNOWMOBILE OF SMALL SIZE

Toshihiro Yasui, and Wayne L. Warnke, both of Coon Rapids, Minn., assignors to Yamaha Hatsudoki Kabushiki Kaisha, Iwata, Japan

Filed Dec. 4, 1980, Ser. No. 213,167

Int. Cl.[3] B62M *27/02*

U.S. Cl. 280—21 R 9 Claims



1. A suspension and steering system for a snowmobile or the like having a body and a pair of skis comprising suspension means for suspending each of the skis for movement vertically relative to the body independently of the other, said suspension means providing pivotal steering movement of each of the skis about a respective generally upstanding steering axis, anti-roll means comprising a torsional bar supported by the body, and means for connecting opposite ends of said torsional bar to a respective one of said skis for torsional loading of said torsion bar upon independent movement of the skis relative to the body, said means for connecting between each of the skis and said torsion bar end being effective to load said torsion bar upon pivotal movement of the skis about their steering axes for providing a self-centering force upon said skis.

4,509,767

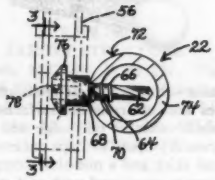
BICYCLE CHAIN HANGAR

Frank P. Brilando, Niles, Ill., assignor to Schwinn Bicycle Company, Chicago, Ill.

Filed Nov. 18, 1983, Ser. No. 553,052

Int. Cl.[3] B62H *13/00*

U.S. Cl. 280—289 R 3 Claims



1. A bicycle chain hangar in combination with a bicycle seat stay comprising:

an elongated body;

a hardened, pointed drill bit of one diameter at the extreme forward end thereof and an externally threaded collar behind said drill bit having hardened, self-tapping external screw threads with a diameter larger than said one diameter and sized to be self-tapping into a bore made by the drill bit;

a diametrically enlarged neck portion immediately behind said threaded collar and having at the rear end of said threaded collar a forwardly facing stop shoulder engaged with the outer surface of a bicycle seat stay; and

a further diametrically enlarged head portion behind said neck portion engageable within a bicycle chain to furnish stationary support therefor during maintenance or repair;

whereby said chain hangar can be removably assembled on a bicycle seat stay by pressing and rotating said drill point against the seat stay to drill a bore in the wall thereof and continuing to rotate it to self-thread the collar into the seat stay until limited by engagement with said stop shoulder.

4,509,768

VEHICLE WITH DETACHABLE IMPLEMENT

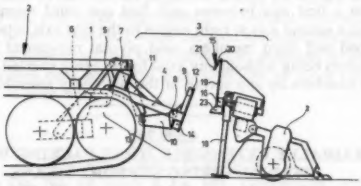
Walter Haug, Blaustein, Fed. Rep. of Germany, assignor to Karl Kassbohrer Fahrezeugwerke GmbH, Olm, Fed. Rep. of Germany

Filed Dec. 1, 1982, Ser. No. 446,014

Claims priority, application Fed. Rep. of Germany, May 24, 1982, 8215040[U]

Int. Cl.[3] E02F *3/80, 3/96*

U.S. Cl. 280—479 R 5 Claims



1. For use in detachably mounting an implement to a vehicle, the vehicle having associated therewith an adjustable take-up frame having at least one coupling element arranged to coact in engagement with a counter-coupling element on the implement, the improvement comprising: a mounting plate arranged

on the implement in a substantially vertical plane extending transversely with respect to the working direction of the implement and the vehicle, the counter-coupling element being in the form of a single downwardly opening hook centrally secured to and protruding rearwardly from the upper portion of said mounting plate, said hook being substantially triangular in shape and having its apex directed downwardly, and the coupling element being in the form of a horizontal pin extending between two laterally spaced cheek plates, said cheek plates forming part of the take-up frame, with the spacing between said cheek plates being only slightly greater than the largest width dimension of said hook, and with said horizontal pin being arranged for engagement beneath said hook as the latter is received between said cheek plates.

4,509,769

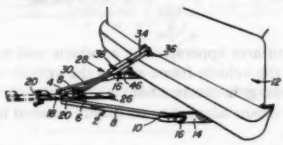
VEHICLE HITCH

Arthur E. Weber, P.O. Box 1026, Weyburn, Saskatchewan, Canada (S4H 2L3)

Filed Nov. 18, 1982, Ser. No. 442,730

Int. Cl.³ B60D *1/14*

U.S. Cl. 280—491 R **7 Claims**



1. A vehicle hitch which is selectively adjustable with respect to extension, elevation and lateral positioning and which is movable to erect storage position on a vehicle, and comprising a frame of general A-shape having an end cross-member and a pair of diverging legs and a central cross-member,

and means to pivotally connect diverging ends of the legs to a vehicle enabling pivoting movement of the frame about a horizontal axis,

and an elongate draw bar having a projecting end adjustably carried by the end and central cross members, the end cross-member carrying a removable securing pin and the draw bar having a plurality of securing pin-receiving holes provided longitudinally therealong permitting selected extension and securement of the draw bar with respect to the end cross-member,

and abutment means on the central cross-member enabling central positioning of the draw bar with respect to the frame or selected positioning of the draw bar generally parallel to one or other of the legs enabling lateral positioning of the projecting end,

and telescoping adjustment means extending between the central cross-member and the vehicle enabling selected pivoted positioning of the frame with respect to the vehicle and securement of the frame in erect storage position.

4,509,770

DRAWBAR COVER

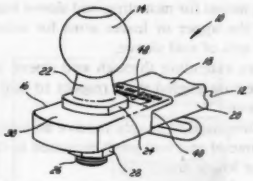
David A. Young, Plymouth, and William H. Hummel, Ann Arbor, both of Mich., assignors to Draw-Tite, Inc., Belleville, Mich.

Filed Jul. 9, 1982, Ser. No. 396,555

Int. Cl.³ B60D *1/06*

U.S. Cl. 280—507 **5 Claims**

1. In a drawbar assembly comprising a drawbar member having a terminal end portion and a ball mounted on said terminal end portion, a cover fitting in close conformity onto said terminal end portion and leaving the ball available for connection with a coupler, said terminal end portion comprising a top surface and said cover comprising a top wall overlying said top surface, aligned apertures through said top wall and said terminal end portion of said drawbar member, said ball being disposed on a stem having a flange overlying said top wall around the aperture therein, and fastening means including a threaded shank passing through said apertures urging said flange, and corresponding said top wall, toward



said drawbar member, the improvement in which said top wall, in the free condition of said cover, has a shape slightly different from that of said top surface so as to be flexed from its free shape by said fastening means.

4,509,771

SKI

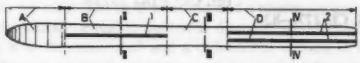
Wolfgang Nussbaumer, Dorkbirn, Austria, assignor to Kästle Gesellschaft m.b.H., Hohenems, Austria

Continuation of Ser. No. 936,937, Aug. 25, 1978, abandoned, which is a continuation of Ser. No. 766,497, Feb. 7, 1977, abandoned. This application Jan. 26, 1982, Ser. No. 342,890

Claims priority, application Austria, Feb. 13, 1976, 1051/76

Int. Cl.³ A63C *5/04*

U.S. Cl. 280—609 **4 Claims**



1. A ski having a front portion with a tip, a rear portion, and an intervening middle portion adapted to support a binding, said portions being provided with a continuous running surface which has mutually different grooved profiles in said front and rear portions and is substantially smooth and ungrooved in said middle portion, the profile of said front portion having only a single longitudinal groove, the profile of said rear portion having a plurality of side by side parallel longitudinal grooves for exerting a greater guiding effect upon the ski.

4,509,772

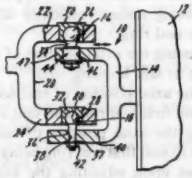
ONE-PIECE ADJUSTING SLEEVE

Frederick L. Drotar, Newport; David R. Wotton, Ann Arbor; Carroll D. Dickerson, New Hudson, and Lawrence A. Makowski, Livonia, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Apr. 9, 1979, Ser. No. 28,627

Int. Cl.³ B62D *17/00*

U.S. Cl. 280—661 **9 Claims**



1. A one-piece adjustable sleeve for a steerable wheel assembly including an axle with lower and upper vertically spaced

control arms connected to a supportive vehicle member, a spindle mounting a wheel assembly, said spindle having lower and upper arms pivotably connected to said control arms, ball joints connecting said control arms to said arms of said spindle; said sleeve comprising;

an outer surface centered about a central axis;

mounting means for mounting said sleeve into an aperture in one of the upper or lower arms for rotation about said central axis of said sleeve,

an aperture extending through said sleeve with the axis of said aperture angled with respect to said central axis of said sleeve;

said aperture sized to snugly receive an integral stud of one ball of one of said ball joints mounted to the other of said upper or lower arms;

said sleeve, ball joint, and stud being constructed to allow said stud to incline and extend through said angled aperture at any rotatably adjusted position of said sleeve; and

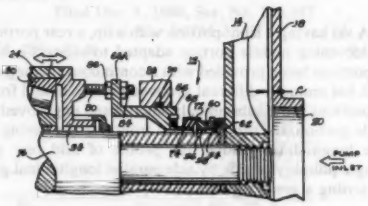
locking means for fixedly locking said stud within said sleeve and said sleeve within said aperture within said arm for securing said spindle in a desired position with respect to said control arms to mount said wheel assembly with a desired camber and castor or pneumatic trail.

4,509,773

PUMP-MECHANICAL SEAL CONSTRUCTION WITH AXIAL ADJUSTMENT MEANS

Robert S. Wentworth, Murrieta, Calif., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed May 9, 1984, Ser. No. 608,627
Int. Cl.³ F16J 15/38
U.S. Cl. 277—82 **6 Claims**



1. A mechanical seal assembly especially adaptable for use with a rotating device housed in a stationary housing and in which the rotating device has a predetermined and desired spacial relationship with the housing and in which the axial position of the rotating device is adjustable to maintain the predetermined and desired spacial relationship with the housing; said mechanical seal assembly comprising a first seal ring connected to rotate and be axially fixed with respect to said rotating device and a second, non-rotating seal ring, said seal rings having lapped seal faces which oppose one another, said assembly also having means resiliently urging one seal ring toward the other seal ring;

means for adjusting the axial position of said rotating means with respect to said housing; and

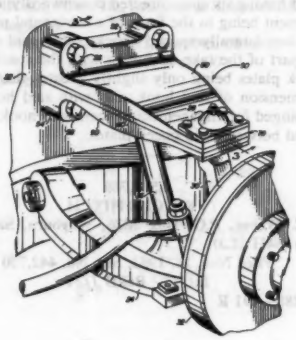
means fixing the axial position of said second seal ring with respect to said first seal ring and said rotating device, said means fixing the axial position of said second seal ring with respect to said first seal ring being so constructed and arranged that upon adjusting the axial position of said rotating means with respect to the housing, the axial position of said seal rings will remain the same with respect to the rotating device.

4,509,774

COMPOSITE CONTROL ARM APPARATUS

Benjamin V. Booher, 1721 Aldersgate, Leucadia, Calif. 92024

Filed Aug. 22, 1983, Ser. No. 525,011
Int. Cl.³ B16F 1/30
U.S. Cl. 280—694 **7 Claims**



1. Control arm apparatus for a vehicle and adapted to be secured to the vehicle frame and to the vehicle wheel assembly, comprising, in combination:

first end means adapted to be fixedly secured to the vehicle frame;

second end means remote from the first end means and adapted to be secured to the vehicle wheel assembly and adapted to move vertically relative to the first end means;

a first portion for providing dimensional integrity extending between and connected to the first and second end means; and

a second portion connected to the first portion for providing flexibility extending between and connected to the first and second end means.

4,509,775

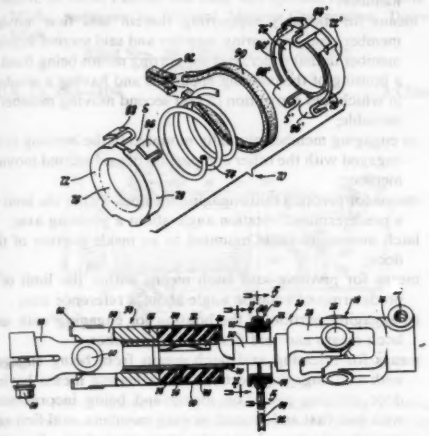
SPRING AND RETAINER ASSEMBLY AND SPRING DELASHED STEERING SHAFTS

Frederick P. Arndt, Saginaw, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Jun. 21, 1983, Ser. No. 506,487
Int. Cl.³ B62D 1/16
U.S. Cl. 280—779 **6 Claims**

1. A compression spring and spring retainer assembly comprising in combination a helical spring, first and second spring seats operatively mounted on opposite ends of said helical spring, loop means extending inwardly from said seats into adjoining position with respect to another when said seats are displaced adjacent to each other and said spring is compressively loaded therebetween, strap means extending through said loop means when said loop means are aligned, said strap having extending end portions providing pull means for releas-

ing said strap means from said loop means to allow said helical spring to expand to a working height and relatively move said



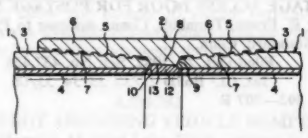
seat means in opposite directions to a predetermined extended position.

4,509,776

CORROSION-RESISTANT PIPE COUPLING STRUCTURES

Toshio Yoshida; Kouyu Itoga, both of Kobe; Shigetomo Matsui, Higashiosaka, and Toshio Atsuta, Akashi, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Filed Mar. 16, 1982, Ser. No. 358,801
Int. Cl.³ F16L *15/00*
U.S. Cl. 285—55 **1 Claim**



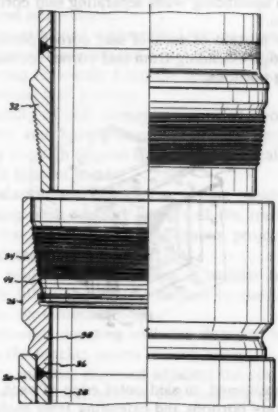
1. A corrosion-resistant pipe coupling structure comprising:
a tubular coupling member including an inner surface and axially opposite ends having internal screw threads for engaging male screw threads provided on axially opposing end parts of two pipes to be coupled, the internal surfaces of each of the pipes being lined with material resistant to corrosive fluids;
an unthreaded intermediate annular projection formed integrally with said inner surface of said coupling member and directed radially inward thereof to be abuttingly engaged by the opposing radial end surfaces of the pipes;
an annular member made of a corrosion-resistant material which is initially separate from said annular projection and welded thereto to be engaged by the opposing radial end surfaces of the pipes lined with said material;
the radially innermost surface of said annular projection forming a tapered bore; and
said annular member having a conical outer surface shaped complementarily to said tapered bore, whereby said annular member can be friction-welded to said annular projection by inserting said annular member into said tapered bore and thrusting it axially of said bore while rotating said annular member into frictional sliding contact with said surface of said bore.

4,509,777

WELD-ON CASING CONNECTOR

James M. Walker, Houston, Tex., assignor to Dril-Quip Inc., Houston, Tex.

Filed Nov. 1, 1982, Ser. No. 438,574
Int. Cl.³ F16L *13/04*
U.S. Cl. 285—286 **6 Claims**



1. A weld-on female casing connector comprising a tubular body with an internally threaded section on its upper end having an outside diameter greater than the outside diameter of the casing to which it is to be connected and a minimum inside diameter substantially equal to the inside diameter of the casing to which it is to be connected and a cylindrical section at its lower end having an inside diameter and an outside diameter approximately equal to that of the casing to which the cylindrical section is to be welded, a connecting section between the threaded section and the cylindrical section that has a gradually decreasing cross-sectional area in the direction of the cylindrical section until the cross-sectional area of the section will be about equal to the cross-sectional area of an ideal transition section, said second then gradually increasing in cross-sectional area in the direction of the cylindrical section until it reaches an outside diameter that is large enough to provide sufficient bearing surface to support the casing and decreasing the cross-sectional area to form a downwardly facing shoulder having the minimum area required to support the casing on elevators to reduce the abrupt change in cross-sectional area at the shoulder to a minimum to provide a connecting section that reduces the stress in the cylindrical section in the plane of the elevator shoulder for a given tensile load.

4,509,778

DUCT JOINT ASSEMBLY

Peter J. Arnoldt, Clairton, Pa., assignor to Ductmate Industries, Pittsburgh, Pa.

Filed Dec. 6, 1982, Ser. No. 447,282
Int. Cl.³ F16L *23/00*
U.S. Cl. 285—406 **9 Claims**

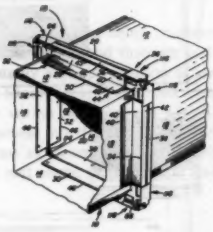
1. A duct joint assembly for connecting the end portion of generally rectangular ducts comprising,
a plurality of flange portions extending upwardly from the end portion of a duct,
each of said flange portions having an upstanding wall and a pair of opposite end portions,
a plurality of angular corner pieces for connecting adjacent flange portions and forming a rectangular frame around the duct end portions,
said corner pieces each having a body portion with a corner

section and a pair of leg portions extending angularly therefrom,

each of said leg portions arranged to extend into abutting relation with said upstanding wall of said flange portions to connect adjacent flange portions on the duct end portion,

said corner piece leg portions on adjacent duct end portions positioned adjacent to each other with said duct flange portion upstanding walls separating said corner piece leg portions,

said body portion of each of said corner pieces having an outer edge extending from said corner section to each of said leg portions,



a flange positioned on said outer edge of each said corner piece body portions and extending from each of said leg portions to said corner section,

a channel-shaped clamp forcibly slidable only on said flanges of said adjacent corner piece body portions to urge said adjacent corner piece body portions toward each other and connect said rectangular frames of adjacent rectangular ducts and exert a sealing force upon said respective duct adjacent flange portion upstanding walls, and

locking means to lock said channel-shaped clamp on said adjacent corner pieces.

4,509,779

LOCKING DEVICE FOR DOOR OF COOKING APPARATUS

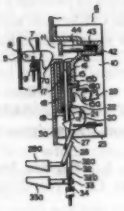
Takafumi Sasaki, Hokkaido, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 16, 1982, Ser. No. 418,835

Claims priority, application Japan, Sep. 21, 1981, 56-140043[U]

Int. Cl.³ E05C *3/32*

U.S. Cl. 292—254 **5 Claims**



1. A locking device for a door of a cooking apparatus, comprising:

a first moving member;

a first spring member operatively connected to said first moving member for elastically supporting said first moving member;

a second moving member having a projection at one end portion thereof;

a second spring member operatively connected to said second moving member for elastically supporting said second moving member, and wherein the urging force of said first spring member is greater than that of said second spring member;

means for movably supporting therein said first moving member, said first spring member and said second moving member in that order, said supporting means being fixed in a housing of the cooking apparatus and having a window in which said projection of said second moving member is movable;

an engaging member pivotally mounted in the housing to be engaged with the other end portion of said second moving member;

means for pivoting said engaging member within the limit of a predetermined rotation angle about a pivoting axis;

latch means pivotable mounted to an inside portion of the door;

means for pivoting said latch means within the limit of a predetermined rotation angle about a reference axis;

an engaging portion of the housing for engaging with said latch means and said first moving member;

means for releasing said latch means from being engaged with said engaging portion, said releasing means having door opening operation means and being incorporated with said first and second moving members, said first and second spring members and said pivoting means for moving said engaging member in order for said engaging member to be engaged with the other end portion of said second moving member while said releasing means releases said latch means from being engaged with said engaging portion upon operation of said door opening operation means; and

means for switching an energizing circuit of the cooking apparatus in response to the movement of said projection of said second moving member.

4,509,780

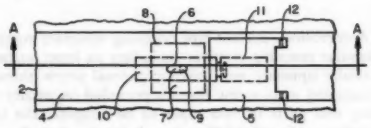
POSTAGE ACCESS DOOR FOR POSTAGE METERS

Timothy R. Erwin, Trumbull, Conn., assignor to Pitney Bowes Inc., Stamford, Conn.

Filed Oct. 28, 1982, Ser. No. 437,426

Int. Cl.³ B65D *27/30, 33/34, 55/06*

U.S. Cl. 292—307 R **15 Claims**

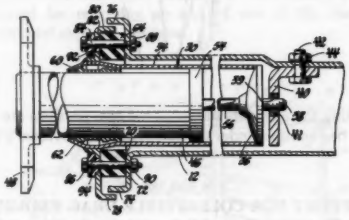


1. A security sealing means comprising in combination a container housing, an access door positioned in said housing, a door locking means and a destructible sealing membrane, said container housing having an aperture extending from the outside of said container housing to said door locking means located within and adjacent to the inside surface of said container housing, said locking means slidably positioned in contact with said access door and adapted to be moved out of contact with said door, said sealing membrane completely enclosing the inside container surface of said opening and sealing said aperture from the atmosphere, said door locking means being exposed only by puncturing said sealing membrane, said door locking means and said sealing membrane are in contact with each other at an intended fracture location, wherein movement of the door locking means to open the access door further rips the sealing membrane.

4,509,781
ISOLATED BUMPER FOR DAMPING VIBRATIONS IN VEHICLES

Melvin E. Dick, Fenton, and Linn A. Peterson, Milford, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 20, 1982, Ser. No. 419,935
Int. Cl.[3] B60R 19/06
U.S. Cl. 293—104 3 Claims

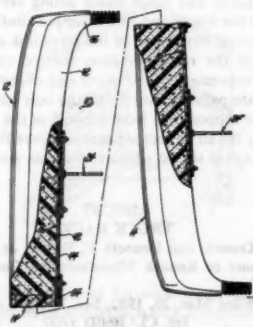


1. A tuned bumper for a motor vehicle having a vehicle body and a vehicle steering column therein to damp vibrations of said vehicle body and said steering column comprising in combination an external bumper disposed at one end of said vehicle body, said vehicle body having support structure for carrying the load of said bumper, connector means for operatively interconnecting said bumper to said support structure, said connector means comprising elongated and telescopic energy absorber means for absorbing the energy of an impact load on said bumper displacing said bumper from a first position outwardly of said vehicle body to a second position adjacent to said support structure, said shock absorber having an inner end spaced from and normally free from contact with said support structure, and resilient elastomer block means preloaded and operatively interposed only between an intermediate portion of said energy absorber means and said support structure to physically space and resiliently isolate said bumper and said energy absorber means from said support structure to allow said bumper to vibrate vertically and in pitch to act as a dynamic vibrating mass to damp vibrations of said vehicle body and components therein.

4,509,782
ENERGY ABSORBING VEHICLE BUMPER

Donald L. Manning, Orchard Lake, Mich., assignor to Transpec, Inc., Troy, Mich.

Filed Sep. 1, 1983, Ser. No. 528,403
Int. Cl.[3] B60R 19/08
U.S. Cl. 293—121 13 Claims



1. An energy absorbing vehicle bumper system of the type including horizontally extending support beam means, bracket means for mounting said beams to the vehicle, and energy absorbing means supported upon said beam on the side thereof opposite from the bracket means, said energy absorbing means including a resilient member enclosed by an elastomeric outer cover means, the improvement comprising:

A. the support beam means comprising a pair of identical beam members adapted to be joined at their horizontally inner ends to provide a bumper structure for spanning the front end of a vehicle;

B. each beam having a generally U-shape cross-section with a vertical wall portion and a pair of horizontal leg portions projecting forwardly from the upper and lower edges of the vertical wall portion;

C. a plurality of bolt elements supported upon each beam member and having threaded shanks projecting rearwardly through aligned holes in the vertical wall portion and the bracket means;

D. said elastomeric cover means being molded about and enclosing each support beam and the resilient member such that the threaded bolt shanks project rearwardly beyond each beam member;

E. each resilient member being a cellular foam material entirely filling the volume defined by the U-shape beam and the elastomeric cover;

F. nut elements coacting with the threaded bolt shanks to mount the bracket means to each beam;

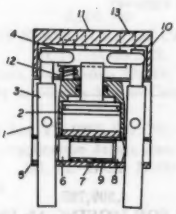
G. a plate member disposed adjacent the rear face of each beam vertical wall portion and spanning the horizontally adjacent inner ends of said beams; and

H. means for fastening said plate member to each support beam whereby said beams are joined and coact to provide a unitary bumper structure.

4,509,783
SMART HAND

Alexandru D. Ionescu, 190 Sport Hill Rd., Easton, Conn. 06612

Filed Dec. 29, 1982, Ser. No. 454,190
Int. Cl.[3] B66C 3/16; F15B 13/42
U.S. Cl. 294—88 4 Claims



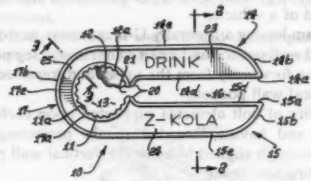
1. A gripper comprising; a body having a piston chamber formed therein, a piston means reciprocally mounted in said chamber, a pair of fingers pivotally mounted intermediate their ends thereof to said body, a cross-bar connected to said piston means, said cross bar being disposed between said fingers, a toggle link interconnecting said cross-bar to each of said fingers whereby the actuation of said piston means effects the displacement of said fingers accordingly, and a sensor means interposed between said fingers for measuring the lateral distance between said fingers upon the actuation of said piston means.

4,509,784

SCREW CAP REMOVER

Gary L. Vollers, 11471 Tampa Ave. No. 149, Northridge, Calif. 91326

Filed Sep. 28, 1982, Ser. No. 425,485
Int. Cl.³ B25B 9/02
U.S. Cl. 294—99.1 2 Claims



1. A container screw-on cap remover, comprising

(a) a split ring having a cap gripping inner surface about a central aperture adapted to receive a bottle cap,

(b) and a pair of handles attached to said ring and extending in generally the same direction away from said ring, said handles being manually graspable and movable relatively toward one another to draw said ring surface into forcible gripping engagement with the cap, whereby the handles may then be rotated to rotate and loosen the cap,

(c) the split ring consisting of an elastomer, and including a U-shaped integral extension of the handles extending part way about said elastomer split ring to provide a hinge and transfer torque to the split ring, the handles and U-shaped extension comprising a one-piece unit consisting of molded synthetic resin,

(d) said U-shaped extension of said handles being integrally attached to said split ring, to transfer handle torque to the ring, the handles and U-shaped extension defining a single web which in turn defines a plane normal to an axis of said ring,

(e) the handles being elongated and the web having flat sides for displaying indicia, the handles each having an I-shaped cross section in planes normal to the handle length dimension, and substantially throughout handle length,

(f) said split ring interior surface being corrugated, the handles and ring defining cusps that project relatively toward one another proximate the split defined by the ring,

(g) the handles and U-shaped extension having outer flanges that merge and define similar convex curvatures at opposite ends of the remover.

4,509,785

APPARATUS FOR MOVING AN INDIVIDUAL

René Van Raemdonck, Burchtstraat, 17, 9400 Ninove, and André Callaert, 4 Septemberdagenlaan, 24, St. Joost-Ten-Noode, both of Belgium

Filed May 13, 1983, Ser. No. 494,366
Claims priority, application Belgium, May 13, 1982, PV 0/208082
Int. Cl.³ A47B 83/04
U.S. Cl. 294—118 7 Claims

1. Apparatus for moving an individual, the apparatus comprising two elements which are each bent to form an arm portion, the arm portions being essentially parallel to each other, said arm portions each bearing supporting members shaped so as to grip the individual to be moved underneath the armpits and sidewise partly about the thorax, and means for

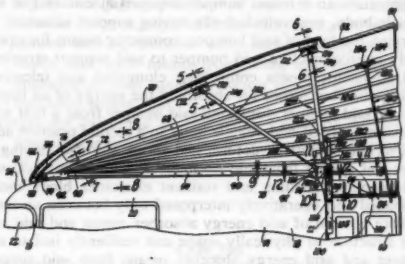
connecting the elements such that the arm portions are moved toward one another under the action of the individual's weight.

4,509,786

SUPPORT FOR COLLAPSIBLE DRAG REDUCER

Willard W. Gregg, Troy, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 8, 1982, Ser. No. 439,755
Int. Cl.³ B62D 35/00
U.S. Cl. 296—1 S 4 Claims



1. In combination with a tractor having a cab roof and a cab rear wall, a support mechanism for moving an air deflector panel pivoted to the cab roof between a pivotally raised air deflecting position and a lowered storage position in which the deflector panel is stored adjacent the cab roof comprising:

a collapsible toggle linkage including a support link having an upper end pivotally connected to the deflector panel and a lower end, a pivot link having a lower end pivotally mounted on the cab rear wall below the roof for pivotal movement between a raised position standing vertically upwardly and a lowered position depending vertically downwardly, and pivot means acting between the pivot link and the lower end of the support link whereby rearward pivotal movement of the pivot link about the lower end from the raised position thereof effects rearward arcuate movement of the lower end of the support link in an arcuate path rearwardly of the rear cab wall to withdraw the support link from support of the deflector panel whereby the air deflector panel is lowered and the collapsible linkage is stored adjacent the rear wall of the cab.

4,509,787

TRUCK RACK

Howard L. Knaack, and Kenneth F. Weger, Jr., both of Cary, Ill., assignors to Knaack Manufacturing Company, Crystal Lake, Ill.

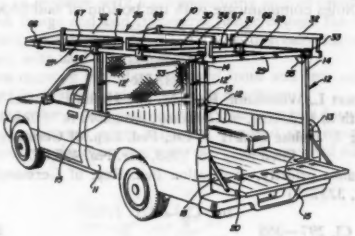
Filed Mar. 29, 1982, Ser. No. 363,107
Int. Cl.³ B60D 3/00
U.S. Cl. 296—3 5 Claims

1. In a rack adapted to be mounted to a truck for providing

an overlying support for ladders and the like, an improved upright support leg structure comprising an elongated upright defining a lower end adapted to be secured to the truck to project vertically upwardly therefrom, and an upper end construction adapted to support a pair of elongated horizontal support elements, said upper end construction comprising:

a distal portion of the upright defining a horizontal support surface;

a socket member having a lower inner end surface resting on said horizontal support surface, and an outer portion cantilevered therefrom defining a horizontally opening channel for receiving an end of one of the elongated horizontal support elements;



an end plate closing an end of the socket member channel;

means securing the end plate to the socket member and said distal upper end of the upright;

retaining means removably associated with said end plate for defining with said end plate a through passage for extension of the other of the elongated horizontal support elements slidably therethrough; and

means for selectively causing said retaining means to clamp the support element in said passage fixedly to said end plate in alignment with the support element in said socket member channel, said end plate having a portion facially abutting said upper end of the upright subjacent said support surface.

4,509,788

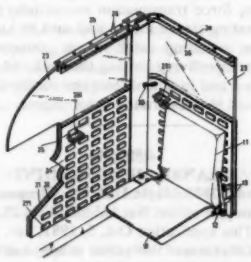
SAFETY ARRANGEMENT IN A TAXI

Ping-Shuenn Jan, No. 33-9, Pu-Tzu, Pu-Yun Tsun, Yung-Kang Hsiung, Tainan Hsieng, and Chung-Yieh Hong, No. 9, Lane 493, Yen-Ping I Rd., Ku-Shan Li, Chi-Shan Cheng, Kao-Hsiung Hsieng, both of Taiwan

Filed Dec. 14, 1982, Ser. No. 449,621

Int. Cl.³ B60R *27/00*

U.S. Cl. 296—24 R **7 Claims**



1. A safety compartment for separating the driver's seat from the occupants of a vehicle which comprises

a driver's seat having a seat portion and a back support portion, said driver's seat being provided with means for causing the back portion to recline toward a horizontal position,

a side vertical partition member mounted to the floor and to the ceiling at one side of the driver's seat,

a rear vertical partition member extending across the back of the driver's seat and extending from the floor to the ceiling and removably connected to the side vertical partition member, said rear vertical partition member being attached to the back support portion of the driver's seat, whereby the side and back partition member surround and separate the driver's seat from the remaining part of the vehicle but when the rear vertical partition member is detached from the side vertical partition member the back support portion of the seat can be placed in a reclining position together with the rear vertical partition member to which it is attached.

4,509,789

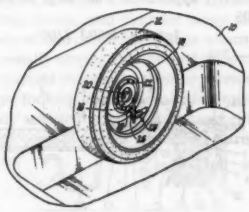
STORAGE RETAINER FOR WHEEL COVER WRENCH

John P. Bogosoff, Battle Creek, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 13, 1983, Ser. No. 541,421

Int. Cl.³ B62D *43/00*

U.S. Cl. 296—37.2 **4 Claims**



1. A storage retainer for storing a wheel cover wrench in a motor vehicle storage compartment having a spare tire mounted therein by a bolt passing through a hole in the spare tire, comprising:

a molded plastic body having an internally threaded bore adapted to screw onto the bolt mounting the spare tire and said molded plastic body having an opening therein adapted to receive the wheel cover wrench whereby the wheel cover wrench is effectively stored upon the spare tire mounting bolt.

4,509,790

LOWER BODY STRUCTURE OF CAB-OVER TYPE AUTOMOBILES

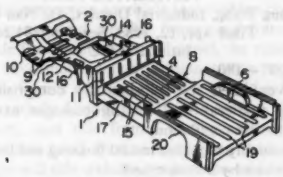
Yoshihito Nagamoto, and Sadao Ozeki, both of Hiroshima, Japan, assignors to Mazda Motor Corporation, Hiroshima, Japan

Filed Jan. 17, 1983, Ser. No. 458,710

Claims priority, application Japan, Jan. 18, 1982, 57-5834

Int. Cl.³ B62D *27/00*

U.S. Cl. 296—204 **16 Claims**



1. A lower body structure for a cab-over type automobile

including a pair of longitudinally extending side frame assemblies, each comprising a front side frame and a rear side frame, a cabin floor panel including a front floor panel connected at least at front and rear portions to said front side frame of each side frame assembly, a rear floor panel connected to said rear side frame of each side frame assembly, each said front side frame having a rearward extension extending rearwardly beyond said front floor panel, each said rear side frame having a forward extension extending forwardly beyond said rear floor panel and connected with said rearward extension of said front side frame, and a central floor panel connected to the rearward extension of the front side frames and the forward extensions of the rear side frames, said front floor panel having a raised portion and front and rear portions, said raised portion being located at a higher position than the front and rear portions of the front floor panel and seat means supported by said raised portion of said front floor panel.

4,509,791

RIGID COVER FOR A VEHICLE TOP

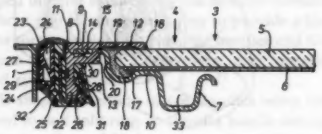
Horst Bienert, Gauting; Georg Kohlpaintner, Maisach, and Hans Jardin, Inning, all of Fed. Rep. of Germany, assignors to Webasto-Werk W. Baier GmbH & Co., Fed. Rep. of Germany

Filed Nov. 4, 1981, Ser. No. 317,983

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1980, 3041505

Int. Cl.³ B60J 7/00

U.S. Cl. 296—216 **18 Claims**



18. In a rigid cover means for closing and at least partially opening an opening in a roof of a vehicle, the cover means including a cover plate formed of a translucent material and frame means for supporting a peripheral edge of the cover plate at the opening in the roof, the frame means including an upper frame member adapted to contact a top of the cover plate and a lower frame member adapted to support a bottom of the cover plate, the improvement for preventing deformations or warping of the cover plate comprising said upper and lower frame members being of a thickness and being rigidly interconnected in a fixed relationship with respect to each other so as to secure the peripheral edge of the cover plate, the lower frame member being a shaped sheet metal part and the upper frame member having an extrusion of light metal, wherein the means for rigidly interconnecting the upper and lower frame members comprises physically interengageable locking means on said frame members.

4,509,792

VENTILATED SEAT

Yen-Hsiung Wang, Industrial District, Tai Nan City, Taiwan

Filed Apr. 12, 1983, Ser. No. 484,265

Int. Cl.³ A47C 7/72

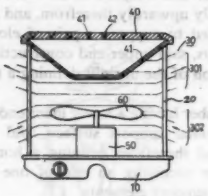
U.S. Cl. 297—180 **7 Claims**

1. A ventilated seat substantially comprising: a housing including a lateral wall having passages extending therethrough for air ventilation;

a fan rotatably mounted in said housing and being adapted to be driven by a motor; and

a seat member mounted on said housing and having a top surface;

wherein the top surface of said seat member is provided with a plurality of holes which communicate with the inside of said housing, and the top surface of said seat member is



provided with a plurality of annular grooves, and said holes communicate with the bottom of said grooves.

4,509,793

CHAIR

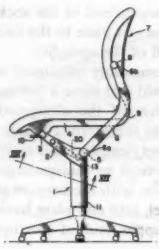
Herbert L. Wiesmann, Hameln, and Heinz P. Suhr, Wunstorf, both of Fed. Rep. of Germany, assignors to Wilkhahn Wilening + Hahne GmbH + Co., Fed. Rep. of Germany

Filed May 16, 1983, Ser. No. 495,077

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1982, 3232771

Int. Cl.³ A47G 1/00

U.S. Cl. 297—355 **24 Claims**



1. A chair comprising a seat portion, a backrest portion flexibly joined to the seat portion, means for urging the backrest portion into a substantially vertical position, support means for supporting the seat portion and backrest portion including a front bearing means articulatingly connected to a front edge of the seat portion, a locking means for locking the backrest portion in the vertical position and at least one inclined position, lock operating lever means pivotably mounted to the support means for controlling an operation of the locking means, a lock operating sleeve means operatively connected to said locking means and extending through said front bearing means, force transmission means interposed between said lock operating sleeve means and said locking means, said locking means including catch means cooperable with said lever means for selectively locking the back rest portion in said vertical position and in said at least one inclined position upon actuation of said lock operating lever means.

4,509,794

PLANAR MEMBER JOINT

Billy F. Roland, 37805 Maple Hill, Mt. Clemens, Mich. 48043

Continuation-in-part of Ser. No. 125,961, Feb. 29, 1980, Pat. No. 4,348,052. This application Oct. 5, 1981, Ser. No. 308,918

The portion of the term of this patent subsequent to Sep. 7, 1999, has been disclaimed.

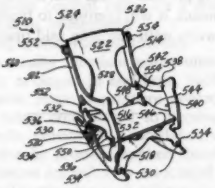
Int. Cl.³ A47C 4/02

U.S. Cl. 297—440 **4 Claims**

1. A knock down chair made from an assembly of interlocking planar members comprising:

a first side member and a second side member;

a seat member;
a pair of transverse seat support members;
a back member having a first side edge, a second side edge; and a downward extending lower flange;
a first pair of spaced apart openings formed proximate a lower edge of the first and second side members;
a second pair of spaced apart openings formed in the first and second side members spaced above the first pair of openings;
a pair of opposed rotatingly engageable hook flanges formed at an outer lower portion of each transverse seat support member, each rotatingly engageable hook flange rotatingly engageable with a corresponding first opening;
a pair of opposed transverse flanges spaced above the pair of opposed rotatingly engageable hook flanges, aligned and snugly engageable with a corresponding second opening;
said hook flange and said transverse flange engage the first and second openings to interlock said transverse seat support with said side members;
an access opening including opposed front and rear edges formed in the first and second side members;
the seat member comprising opposed outer edges, a forward edge, a rearward edge, a pair of opposed side member engaging hooks open at the forward and rearward edges



respectively formed inward from each of the opposed outer edges snugly engageable with first and second side members, each side member engaging hook including an opening inner edge abutting an opposed edge of the access opening;
a first pair of spaced apart hook flanges disposed along the first side edge;
a second pair of spaced apart hook flanges disposed along the second side edge;
the first and second pairs of hook flanges comprising an upper portion projecting outward from and integral with its corresponding side edge, an outer portion extending downward from and integral with the upper portion spaced outward from its corresponding side edge,
an upper opening and a lower opening formed in the first and second side members aligned and snugly engageable with a corresponding pair of spaced apart hook flanges;
the lower opening in communication with said access opening along a rear edge thereof and sized to snugly receive said upper portion;
wherein when the hook flange upper portion has engaged the lower opening and said seat member is installed, a rear edge of said seat abuts said lower flange to prevent the unintended disassembly of the chair, and no fasteners are required to complete the chair assembly.

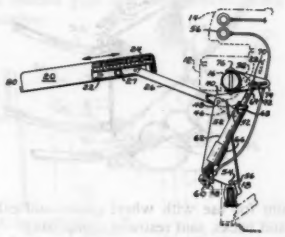
4,509,795

SELF-DEPLOYING LEGREST ASSEMBLY

Edward J. Brennan, Litchfield, and John H. Pratt, Jr., Bethlehem, both of Conn., assignors to PTC Aerospace Inc., Bantam, Conn.

Filed Sep. 9, 1982, Ser. No. 416,393
Int. Cl.³ A47C 7/50
U.S. Cl. 297—434 **9 Claims**

1. A self-deploying legrest assembly for a vehicle seat comprising a cushioned legrest panel member; said seat having a seat frame including an upper transverse tubular front stretcher member, said panel member being supported for movement between a vertical storage position and a generally horizontal use position by a pair of elongated support arms which are pivotally mounted underneath the bottom cushion of the seat to said tubular stretcher member by a pivotable linkage means; cooperating slide means on said panel member and on said pair of support arms for mounting and permitting fore and aft movement of said legrest panel member relative to said bottom seat cushion of said vehicle seat; said pivotable linkage means including at least one member attached to a lower forward



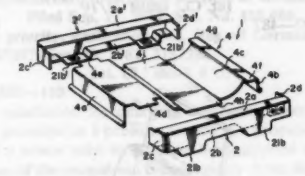
portion of the seat frame and at least one other member attached to said support arms; an extensible cylinder incorporating a spring biasing means, said cylinder being connected to one of the members of said pivotable linkage means and to said seat frame for normally urging said pair of support arms and the legrest panel carried thereby to their uppermost generally horizontal position; locking means for maintaining said extensible cylinder at any selected point in its movement range and manually actuated control means for momentarily releasing said locking means.

4,509,796

SEAT FRAME FOR VEHICLE SEAT

Genjiro Takagi, Tokyo, Japan, assignor to Tachikawa Spring Co., Ltd., Tokyo, Japan

Filed Dec. 28, 1982, Ser. No. 453,937
Claims priority, application Japan, Dec. 29, 1981, 56-195022[U]; Dec. 29, 1981, 56-195023[U]
Int. Cl.³ A47C 7/02
U.S. Cl. 297—452 **4 Claims**



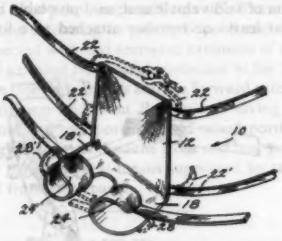
1. A frame for supporting a vehicle seat cushion comprising a substantially pan-shaped metallic frame, said frame having two distinct side frames and a central panel, the central panel being formed from metal which is thinner than metal from which said side frames are formed, each of said side frames having a substantially U-configured cross section and upper end lower parts, said side frames having ends which are curved, said center panel further comprising front and rear inclined margins and side welding projections, said side frames and said center panel being attached to each other wherein said center panel margins and said welding projections are are fitted to said side frames and welded to each side frame.

4,509,797

WHEEL CHAIR RESTRAINT

Maxine M. Mullaly, 64 Larch Rd., Sayre, Pa. 18840

Filed Jul. 18, 1983, Ser. No. 514,483
Int. Cl.³ A47C 31/00
U.S. Cl. 297—466 4 Claims



1. A restraint for use with wheel chairs and other chairs having seats and backs, said restraint comprising:

a flexible first portion for placement against the back of said chair and against which a patient's back may rest;

first and second flexible and distinct extension portions integral with and projecting forwardly from said first portion for placement onto the seat of said chair and upon which the thighs of said patient may rest;

means in operative relationship with said first portion for removably securing said first portion to said chair;

a first flexible restraining strap portion integral with said first extension portion and positioned to be selectively wrapped upwardly about an inner portion of a first thigh of the patient;

means in operative relationship with said first strap portion for removably securing said first strap portion to said chair;

a second flexible restraining strap portion integral with said second extension portion and positioned to be selectively wrapped upwardly about an inner portion of a second thigh of the patient; and

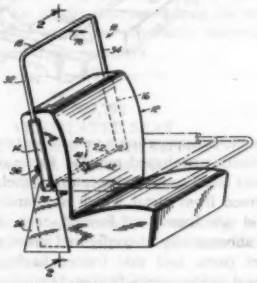
means in operative relationship with said second strap portion for removably securing said second strap portion to said chair.

4,509,798

VEHICLE SEAT HARNESS

John Strothers, 175 W. 137th St., New York, N.Y. 10030

Filed Aug. 23, 1982, Ser. No. 411,086
Int. Cl.³ B60R 21/10
U.S. Cl. 297—487 10 Claims



1. A vehicle seat harness assembly for use with a vehicle seat having a seat portion and back portion extending upwardly from a rear end of the seat portion, comprising:

a substantially U-shaped harness including a pair of pivot arm portions and a body restraining portion extending between and interconnecting said pivot arm portions;

means for hingedly mounting said harness with respect to said vehicle seat so as to be freely pivotable around a pivot axis;

stop means for limiting the pivotal movement of said harness between an inoperative position wherein both of said pivot arm portions extend upwardly from said pivot axis and said body restraining portion is situated substantially over the back portion of the seat and wherein the center of gravity of said harness is situated above and at least slightly rearwardly of said pivot axis, and an operative position wherein both of said pivot arm portions extend forwardly of said pivot axis and said body restraining portion is situated substantially over the seat portion of the seat; and

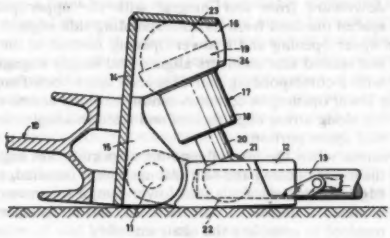
actuating means in the vehicle seat for automatically pivoting said harness when in said inoperative position, in response to a vehicle occupant sitting in the seat, from said inoperative position to a position intermediate of said inoperative and operative positions wherein the center of gravity of said harness is situated above and at least slightly forwardly of said pivot axis, so that upon said harness being pivoted to said intermediate position by said actuating means, it will continue to freely pivot under the force of gravity until reaching said operative position.

4,509,799

APPARATUS FOR CONTROLLING THE POSITION OF A MINERAL MINING MACHINE

Franz Roling, Nordkirchen, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia, Lunen, Fed. Rep. of Germany

Filed Jan. 4, 1983, Ser. No. 455,609
Claims priority, application Fed. Rep. of Germany, Jan. 5, 1982, 3200082
Int. Cl.³ E21C 35/12
U.S. Cl. 299—42 14 Claims



1. In apparatus for controlling the position of a mineral mining machine movable along guide means and comprising one or more elongate rods, connection means effecting pivotal connection between the guide means and said one or more rods, and at least one piston and cylinder unit connected between the guide means and the connection means with the aid of one or more ball-and-socket joints and operable to adjust the guide means; the improvements characterized by: the unit having a ball forming part of said one joint, said ball having a curvilinear end region and a curvilinear shoulder with a larger radius of curvature than that of the end region, and means for inhibiting the rotation of said unit about its longitudinal axis.

4,509,800

BRAKE PRESSURE CONTROL VALVE OF A DOUBLE PIPING SYSTEM

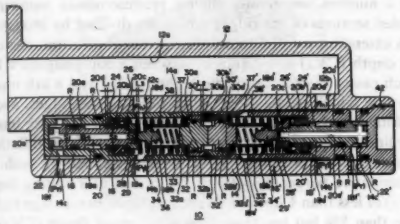
Hitoshi Kubota, Minami-ashigara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 30, 1982, Ser. No. 454,615

Claims priority, application Japan, Mar. 23, 1982, 57-46120

Int. Cl.³ B60T *8/26*

U.S. Cl. 303—6 C **6 Claims**



1. A brake pressure control valve for a double piping hydraulic braking system, comprising:

a housing having a bore formed therein;

a pair of substantially identical valve units coaxially and symmetrically arranged in said bore, each valve unit including a valve body, a pressure control piston and a spring, and being constructed to produce a controlled outlet hydraulic pressure in accordance with the magnitude of a hydraulic pressure applied thereto;

a pair of free pistons respectively associated with the paired value units and contacting each other to be movable therewith, said free pistons supporting the associated valve bodies and one end of the associated springs to cause one of said valve units to produce, when the other valve unit fails to operate, an outlet hydraulic pressure which is equal to the applied pressure in magnitude; and

a self-centering promoting means which causes each of the springs to apply no force to the corresponding free piston when said corresponding free piston moves away from its home position toward the other of said free pistons, said self-centering promoting means comprising:

associated with said each valve unit:

a valve casing;

a hollow member retained in said casing to retain substantially all essential parts of the associated valve unit in the casing, said hollow member having a shoulder portion which protrudes into the interior of said casing;

a radially outwardly projected portion of the associated free piston being axially slidably received in said hollow member, said associated free piston having an outside end contacting the other free piston of said pair of free pistons; and

an annular spring seat on which said one end of said spring is seated, said spring seat being in abutment with both said shoulder portion and said radially outwardly projected portion at the same time when said associated piston assumes its home position.

4,509,801

FLUID PRESSURE BRAKE CONTROL SYSTEMS FOR FREIGHT LOCOMOTIVES

Ronald O. Newton, Adams, and Eric Wright, Watertown, both of N.Y., assignors to General Signal Corporation, Stamford, Conn.

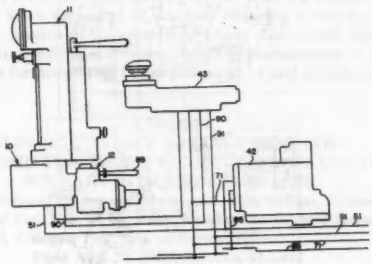
Filed Nov. 18, 1983, Ser. No. 553,332

Int. Cl.³ B60T *13/00*

U.S. Cl. 303—8 **7 Claims**

1. A fluid pressure brake control system of the direct release type for a freight locomotive comprising a first pipe bracket having a manually controllable automatic brake valve device connected thereto on one side for governing fluid brake control pressure in a train pipe, and a manual controllable independent brake valve device connected thereto on another side for governing brakes of the locomotive independent of brakes of freight cars in a train, and a brake control valve device comprising a second pipe bracket governed in part by fluid in the brake pipe for controlling brakes of a locomotive, wherein an improved brake control device and second pipe bracket comprises:

(a) a service freight brake valve portion secured to one side of the second pipe bracket for controlling brakes of a locomotive,



(b) the service freight brake valve portion being the same as, and interchangeable with, service valve portion conventionally used on US freight cars to control brakes of such cars, and

(c) a quick release and emergency valve portion secured to another side of the second pipe bracket for governing emergency brake pressure and for governing independent direct release of brakes of a locomotive in response to actuation of the manually controllable independent brake valve device.

4,509,802

INSTALLATION FOR CHARGING A PRESSURE RESERVOIR PROVIDED AS A PRESSURE SOURCE WITHIN A PROPULSION CONTROL SYSTEM OF A MOTOR VEHICLE

Friedrich Solleder, Waiblingen; Hellmut Krohn, Esslingen; Manfred Burckhardt, Wiblingen, and Franz Brugger, Winnenden, all of Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Sep. 17, 1982, Ser. No. 419,486

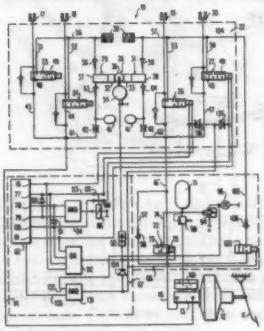
Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137287; Sep. 18, 1981, 3137286

Int. Cl.³ B60T *8/02*

U.S. Cl. 303—110 **46 Claims**

1. An installation for charging a pressure reservoir means which is provided as a pressure source in a propulsion control means of a motor vehicle, pressure being applied during control phases of the propulsion control means from said reservoir means to wheel brake means of the wheel which, at the instant in question, is tending to spin, an anti-blocking means in the vehicle having hydraulic control means for regulating the brake pressures at the wheel brake means, said hydraulic control means including brake-pressure regulating valve means individually coordinated to the wheel brake means and operable to be shifted into a pressure build-up position, a pressure-holding position, or a pressure-reduction position, a return pump means activated at least during the control phases in which pressure reduction occurs, electronic control means for shifting the brake-pressure regulating valve means in the sense of effecting propulsion control, the return pump means, activated during the pressure-reduction phases of the propulsion control, being also operable to recharge the pressure reservoir

means, characterized in that the pressure reservoir means is a high-pressure reservoir which can be charged to a pressure of about 160–200 bar required for the pressure actuation of the wheel brake means, a master brake cylinder means having an outlet pressure chamber means, solenoid valve means operable to connect in the normal position thereof the outlet pressure chamber means with a brake line means leading to the brake-pressure regulating valve means of the driven wheels, the pressure reservoir means being operatively connected to said brake line means, instead of the connection of the master brake



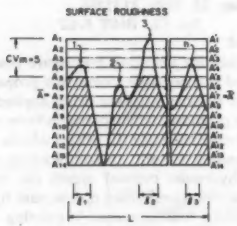
cylinder means to said brake line means, upon energization of said solenoid valve means, which is logically linked to activation of the propulsion control means, so that the reservoir means can be charged by the return pump means also operatively connected on its outlet side to said brake line means, and in that a pressure monitor means is provided responding to the pressure in the reservoir means and generating an electrical output signal operable to trigger an operation to charge the pressure reservoir means when the pressure therein drops below a minimum intended value.

4,509,803

SLIDING MEMBER HAVING A NOVEL PORE STRUCTURE ON THE SLIDING SURFACE THEREOF

Akira Takenaka; Keiichi Shimasaki, both of Nagoya, and Yasumitsu Kuwazuru, Toyota, all of Japan, assignors to Taiho Kogyo Co., Ltd., Aichi, Japan

Filed Nov. 4, 1983, Ser. No. 548,760
Claims priority, application Japan, Nov. 8, 1982, 57-194559
Int. Cl.³ F16C *33/12*
U.S. Cl. 308—5 R **19 Claims**



1. A sliding member which has a hardness of at least HRc 50 and has micropores for determining the surface roughness of the sliding surface thereof, wherein said micropores, when measured with a particle counter, in an amount ranging from 5% to 40% based on an area of the sliding surface and ranging from 2,000 to 150,000 per mm^2 of the sliding surface have a diameter of at least 0.5 μm and further have a top portion of ridges which define said micropores and which have a high flatness in terms of the relative load curve, said relative load curve being defined by an accumulative percentage (t_k) and a cutting depth (CV_k) and said accumulative percentage (t_k) being defined by:

$$t_k = \frac{l_1 + l_2 + \ldots + l_k}{L} \times 100(\%),$$

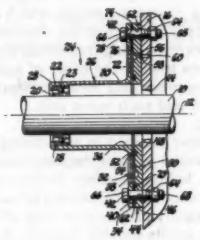
wherein L is the standard measuring length of the sliding member extending in a direction parallel to the sliding surface, k is a number not greater than a predetermined number of divided sections of the ridges which are divided by imaginary lines extending parallel to an average roughness line, the cutting depth (CV_k) is a distance between a top imaginary line which passes over a top of the highest ridge and a kth imaginary line which passes over one or more of the ridges, and l_k is a total length of the ridges which are cut by the knth imaginary line corresponding to the cutting length CV_k, said flatness in terms of the relative load curve being defined by both: an accumulative percentage (t_k) of 5% or less at a cutting depth (CV_k) of less than 1 μm and an accumulative percentage (t_k) of more than 5% but less than 40% at a cutting depth (CV_k) of less than 0.5 μm.

4,509,804

BEARING MOUNT WITH SQUEEZE FILM DAMPING

Steven A. Klusman, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 27, 1983, Ser. No. 498,969
Int. Cl.³ F16C *27/04*
U.S. Cl. 384—99 **4 Claims**

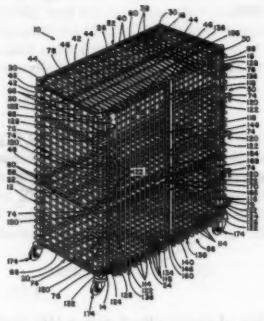


1. In a mount for a bearing on a shaft rotatable about a longitudinal axis and subject with said bearing to radial and axial vibratory displacement relative to said axis, the combination comprising, a tube aligned on said axis and including a first end and a second end, means mounting said bearing on said tube at said first end for vibratory displacement therewith, a diaphragm spring having an outer diameter and a resilient planar portion, means rigidly connecting said tube at said second end thereof to said diaphragm spring, means attaching said diaphragm spring at said outer diameter thereof to a structure fixed relative to said shaft so that each of said radial and axial vibratory deflections of said tube vibratorily distorts said diaphragm spring planar portion, wall means in spaced parallel relation to said diaphragm spring planar portion cooperating therewith in defining a planar squeeze film chamber, and means for maintaining said squeeze film chamber filled with fluid so that vibratory distortion of said diaphragm spring planar portion is resisted and damped by forces developed in said fluid.

4,509,805
ENCLOSED SHELVING

John H. Welsch, Moscow; John J. Chapko, Wilkes-Barre, and Robert J. Carver, Nanticoke, all of Pa., assignors to Metropolitan Wire Corporation, Wilkes-Barre, Pa.

Filed Aug. 9, 1982, Ser. No. 406,251
Int. Cl.³ A47B 57/00
U.S. Cl. 312—210 28 Claims

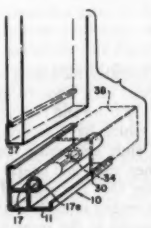


1. Enclosed shelving comprising:
a top shelf supported above a bottom shelf, each of said shelves having a peripheral lip;
side panels and a rear panel having an open wire construction disposed about said shelves;
retaining finger means extending from upper and lower ends of said panels for engaging said peripheral lip of each of said shelves to retain said panels in place about said shelves;
coupling means interconnecting said side panels and said rear panel;
a pair of front door panels having an open wire construction;
hinge means interconnecting each of said side panels to an associated one of said door panels;
closure means for closing said front door panels; and
said closure means including a vertically sliding bar secured onto one door panel of said pair, downwardly depending gripping fingers coupled to top and bottom portions of said bar for respectively engaging said peripheral lip of said top and bottom shelves when said bar is slid downwardly and releasing said peripheral lip when said bar is slid upwardly.

4,509,806
POST ASSEMBLY FOR KNOCK-DOWN FURNITURE

Jean-Paul Dudouyt, Les Camelias, Place des Palniers, 44500 La Baule les Pins, France

Filed Apr. 15, 1982, Ser. No. 368,775
Claims priority, application France, Apr. 16, 1981, 81 07706
Int. Cl.³ A47B 88/00
U.S. Cl. 312—257 SK 10 Claims

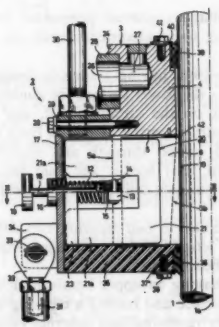


1. A post assembly for knock-down furniture comprising an exterior section having the general shape of an angle iron with intersecting sides which are intended to form the corresponding corners of a piece of furniture formed by partitions, and an interior section having upper and lower ends, said interior section connected to the exterior section, substantially receiving the plane bisecting the corner as a plane of symmetry and intended for preventing a transverse displacement of the partitions forming corresponding sides of the furniture by being applied against the internal faces of these partitions, in which said interior section includes, at least at each of its ends, one section of a tubular element which is in contact with the partitions and sufficiently closed to cooperate with a securing means for securing a cover means at a lower end of said post such as a lower partition pierced by said securing means and securing at an upper end of said post covering means and at least one section of said post is provided with detent means cooperating with lateral means carried by the partitions of the furniture for preventing the displacement of said partitions.

4,509,807
SLIDING CONTACT ARRANGEMENT FOR TRANSMITTING HEAVY CURRENTS FROM AND TO BUS BARS WITH SLIDE SURFACES

Uwe Reimpell, Hanau am Main, and Otto Stenzel, Gründau, both of Fed. Rep. of Germany, assignors to Leybold Heraeus GmbH, Cologne, Fed. Rep. of Germany

Filed Aug. 27, 1982, Ser. No. 412,462
Claims priority, application Fed. Rep. of Germany, Aug. 28, 1981, 3134017
Int. Cl.³ H01R 41/00
U.S. Cl. 339—9 R 14 Claims



1. In a sliding contact arrangement for transmitting a heavy current to or from a bus bar having a slide surface along which the arrangement is to be slidably movable, the arrangement having cage means (3) for mounting the arrangement on the bus bar slidably of the slide surface of the bus bar, the cage means (3) having prolongation means (5), the prolongation means (5) comprising at least one current-conducting contact face (7) extending toward the slide surface of the bus bar to an inner end (5b) thereby when the arrangement is mounted thereon and defining a space (6) from an adjacent portion of the cage means for receiving at least one current-conducting sliding contact (8) in the space (6), the sliding contact (8) having a slide face (10) for engaging the slide surface of the bus bar, whereby to transmit the heavy current thereto or therefrom, and a face (9) for engaging the contact face (7), the improvement comprising:
means in the cage means (3) for transmitting the heavy current to or from the prolongation means (5);
the current-conducting contact face (7) of the prolongation means (5) conducting the heavy current to or from the sliding contact (8) when engaged therewith; whereby to distribute the density of the heavy current over the engaged faces; and

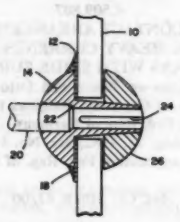
engaging means (21, 13) for engaging the face (9) of the sliding contact (8) with the contact face (7) of the prolongation means (5) and for engaging the face (10) of the sliding contact (8) and the slide surface of the bus bar (1) sufficiently for conducting the heavy current therebetween with the sliding contact (8) spaced from the adjacent portion of the cage means across the space (6) when the sliding contact is received in the arrangement and the arrangement is mounted the bus bar.

4,509,808

HIGH VOLTAGE, GAS TIGHT CONNECTOR

Leroy L. Hellgren, Los Gatos, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 18, 1983, Ser. No. 476,749
Int. Cl.³ H05K 1/00
U.S. Cl. 339—17 R 2 Claims



2. A high-voltage electrical connector for high-voltage gas-tight coupling to an electrical circuit on a circuit board comprising:

(a) a socket portion having a smooth hemispherical upper surface and a flat lower surface for contact with the electrical circuit on the circuit board, said socket further having a central tapering extension from said flat surface sufficient to extend through and slightly beyond said circuit board, said socket and said tapering extension having a continuous central bore for receiving electrical wire;

(b) at least one slot in said tapering extension, said slot extending the length of said extension protruding beyond said circuit board; and

(c) a cap nut having an upper hemispherical surface and a lower flat surface and having a tapering central bore for compressably receiving said tapering extension whereby said cap nut is pressed upon said tapering extension with said flat surface facing said circuit board with predetermined force compressing said tapering extension to form a gas-tight electrical line-contact with said wire.

4,509,809

SIGNAL LEAD-OUT APPARATUS

Cheng-Shi Wang, Pai-Kou Village, Hun-Tan District, Chang-Hua Hsien, Taiwan

Filed Mar. 23, 1983, Ser. No. 478,117
Int. Cl.³ H01R 4/66
U.S. Cl. 339—14 R 9 Claims

1. An improved signal lead-out apparatus comprising:

(a) a base body (21) having an open groove (27) for receiving outgoing TV antenna wires (90), a plurality of notches (211) formed in one side of said body, and an accommodating housing (30) provided on another side of said body;

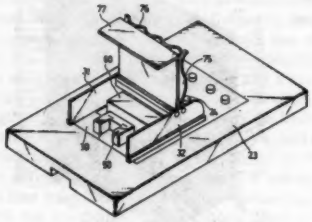
(b) pinch-in means (50) disposed in said open groove for the termination of said outgoing TV antenna wires;

(c) an elastic inserting means (40) installed in said accommodating housing for the termination of an incoming coaxial cable;

(d) a circuit device (60) provided in said accommodating housing for making electrical connections between said pinch-in means and said elastic inserting means; and

(e) a covering device (22) coupled with said base body in cooperation with said pinch-in means for accomplishing signal lead-out connections therewith, wherein

(f) said elastic inserting means comprises a housing body (41) of non-conductive material with a plurality of spaces (42, 43, 44) separately formed in a top side thereof and a plurality of apertures (471) horizontally formed in a frontal side thereof; and



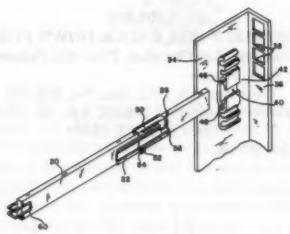
(g) a plurality of elastic chuck pieces (45) made of conductive material and each formed with a chuck end (46) and a flake end (48) respectively fixed in said spaces of said housing body with said chuck ends separately communicating with said apertures for making electrical connections with inner conductors of the incoming coaxial cable through inserting operations, and with said flake ends respectively extending out of the top side of said housing body for being connected to said circuit device thereof.

4,509,810

RACK WITH CARD FRAMES ADJUSTABLE ON LATERAL SLIDE GUIDES

David P. Erlam, and Arthur E. Carr, both of Winchester, England, assignors to Rittal-Werk Rudolf Loh GmbH & Co. KG, Fed. Rep. of Germany

Filed Apr. 21, 1983, Ser. No. 486,991
Claims priority, application United Kingdom, Apr. 21, 1982, 8211566; Apr. 13, 1983, 8310016
Int. Cl.³ H05K 7/14, 7/16
U.S. Cl. 339—17 M 22 Claims



1. A rack for adjustable mounting of card frames provided with side plates, said rack comprising: two vertical angular mounting members in front and two vertical angular mounting members in back which have secured thereto for each card frame two lateral slide assemblies, oppositely oriented with respect to each other, each said lateral slide assembly comprising a support beam (30) the ends of which are inserted in receptacles (40) provided in each of two receptacle members (42) which are secured to the respective said front and back angular mounting members (32, 34) of said rack; a carriage (50, 50') adjustably mounted on each said support beam, each said

carriage being provided at its inner faces with an extending lower projection (52, 52') defining a supporting surface (54, 54') and with an extending upper projection (56, 56'); a rearwardly projecting cantilevr means (22, 22') is provided at each side plate (10, 12) of said card frame, said cantilever means (22, 22') having a recess (26, 26') on the upper edge of each free end for connection with said projection (56, 56') on said carriage (50, 50'); and said cantilever means (22, 22') when positioned in a tilted condition upon said supporting surfaces (54, 54') are slidably insertable, and by lowering said card frame engagement of said projections (56, 56') with said recesses (26, 26') is obtained and said card frame is secured to said carriage (50, 50') in a horizontally and axially non-displaceable relationship.

4,509,811

PRINTED-CIRCUIT BOARD CONNECTOR

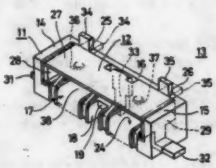
Katutoshi Amano, Yokohama, and Toshio Kakuta, Higashiosaka, both of Japan, assignors to Sony Corporation, Tokyo and Hosiden Electronic Co. Ltd., Osaka, both of, Japan

Filed Aug. 12, 1983, Ser. No. 522,778

Claims priority, application Japan, Aug. 23, 1982, 57-127632[U]

Int. Cl.³ H01R *23/70*

U.S. Cl. 339—17 F **17 Claims**



1. A printed-circuit board connector comprising:

a substantially rectangular elongated parallelepiped first body fabricated of a synthetic resinous material, said first body having contact receiving grooves formed in one of the rectangular faces thereof, said contact receiving grooves extending in the width direction of said first body and being arranged side by side to one another in the lengthwise direction of said first body, said first body also having first and second insertion slots formed in the opposing end portions thereof parallel to said grooves and in spaced relation thereto;

a second body comprising an elongated substantially rectangular metal plate having first and second integral leg portions extending at right angles to the plane of said plate at the opposing narrower ends of said plate, said second body further including first and second fixing pieces having widths narrower than the widths of said first and second leg portions and extending integrally from said first and second leg portions in parallel relation to one another and in directions perpendicular to the plane of said metal plate, said first and second fixing pieces being inserted into one end of said first and second insertion slots, respectively, from the side of said first body on which said contact receiving grooves are formed, said first and second fixing pieces extending completely through said insertion slots so that the free end portions of said first and second fixing pieces project out of the other ends of said first and second insertion slots, said free end portions of said first and second fixing pieces being deformed to fixedly attach said first and second bodies to one another to form a connector body having first and second elongated rectangular faces, first and second side faces connecting said first and second elongated rectangular faces at both ends thereof, and front and rear faces, all of which faces are defined respectively by the outer surfaces of said first and second bodies, said metal plate of said second body being spaced by said leg portions from the face of said first body having said contact receiving grooves to define an insertion opening in said connector body that is located between said first and second bodies for receiving therein a printed-circuit sheet; and

a plurality of contact members having intermediate portions which are embedded in said first body to extend in a direction parallel to the direction of insertion of the printed-circuit sheet into said insertion opening, one end portions of said contact members projecting outwardly from said front face of said connector body and being folded back into said contact receiving grooves to form contacts, and the other end portions of said contact members projecting outwardly from said rear face of said connector body for use as terminals.

4,509,812

PLUG CONNECTOR FOR DIL COMPONENTS

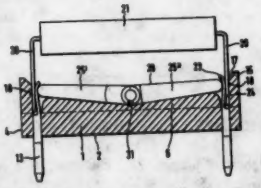
Karl Lotter, Falkenstr. 2, D-8959 Buching, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,844

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1982, 3214841; Feb. 25, 1983, 8305384[U]

Int. Cl.³ H01R *13/629*; H05K *1/00*

U.S. Cl. 339—75 M **26 Claims**



1. A multi-pin connector for use with a dual-in-line component having pins placed in two lines that are parallel to each other, comprising:

(a) an insulating socket body having a middle portion

(b) socket contacts in said body, said contacts

(1) being placed at points lined-up with the pins of a dual-in-line component to be fitted in said socket,

(2) each said contact having a soldering end part designed as a soldering pin and sticking out at a right angle from a side of said body that is to be placed on a printed circuit board,

(3) each said contact having a middle keeper part fitted at least partly with a locking fit in the socket body, said middle part running through the socket body,

(4) and each having a further end part opposite to said first noted end part, said further end sticking out from a side of the socket body opposite to the said board, said further end part being in the form of a spring element for at least part of its length that may be moved in a direction at a right angle to a lengthways axis of said body, said body further having support face means of which each is opposite to one of said further contact ends along sides of the said body, the spacing between the support face means and the further ends of the contacts being such that the pins of said dual-in-line component may be taken up therebetween.

(c) two clamping plates forming a clamping system having lengthways edges at which they are foldingly joined together along a folding line, said plates having outer plate edges parallel to said fold line, said socket having keeper lug elements fitted partly round said outer plate edges, said plates being able to be folded between an unclamped position and a clamping position with said plate edges resting against the said spring elements in these two said positions, the clamping plates being folded and sloped away from said board in said unclamped position like a roof and in the clamping position being in a plane that is

parallel to the side of said socket body next to said board, said spring elements being pressed towards said pins of said dual-in-line component in said clamping position to press said pins against said support faces with a clamping bias force

(d) said body further having a stop face on the side thereof facing away from said board, said stopface having two sloped surfaces that are sloped like the sides of a valley inward towards the socket body middle portion and towards the side of said socket body next to said board

(e) said clamping plates being able to be folded past the clamping position thereof into a locking position, in which the clamping plates are sloped like the sides of a valley towards said board and in which said clamping plates are at least partly rested against said sloped surfaces on said stop face and

(f) each spring element is in the form of solid spring tonguepiece with a front face resting against one of said edges of said clamping plates and with a back face turned towards the support face, said tonguepiece and edges being shaped so that the bias force exerted by said edge against said tonguepiece in said locking position is less than said clamping bias force, but sufficient to clamp said pins within said socket body to thereby prevent said clamping plates from inadvertently moving back through said clamping position to said unclamped position once said clamping plates have been moved to said locking position.

4,509,813

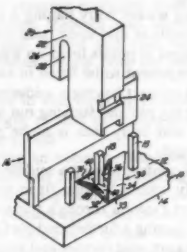
RETAINING CLIP FOR HOLDING A CONNECTOR TO A PANEL

David L. Hesse, Chicago, Ill., assignor to Allied Corporation, Morristown, N.J.

Filed Nov. 1, 1983, Ser. No. 547,693

Int. Cl.³ H01R *13/627*

U.S. Cl. 339—91 R **4 Claims**



1. A retaining clip for releasably holding a socket electrical connector in engagement with a pin projecting from a circuit board, the socket electrical connector including a dielectric housing having an abutment shoulder and an aperture for fitting about the pin, said retaining clip being characterized by: a base adapted to seat on the circuit board and comprising a like pair of base members interconnected along one like lateral edge, means operative with each said base member for engaging one said pin, and means including a bracket extending upwardly from said interconnection for engaging one said abutment shoulder, each said base member including a pair of upwardly extending plate portions with each said plate portion having a V-shaped notch disposed therein to define a plurality of lances, said pin engaging means being defined by each respective pair of plate portions and associated notches cooperating to define an opening for receiving the respective pin with each said notch having an edge to frictionally engage an edge of the pin, and said bracket includes a pair of locking prongs each being directed downwardly from said bracket toward one respective base member.

4,509,814

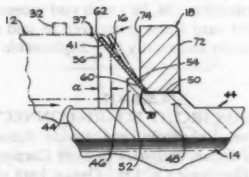
ELECTRICAL CONNECTOR SHELL ASSEMBLY WITH CONTINUOUS ANNULAR SEAL

William R. Mattingly, Jr., Santa Ana, Calif., assignor to Matrix Science Corporation, Torrance, Calif.

Filed Sep. 30, 1982, Ser. No. 431,483

Int. Cl.³ H01R *4/00*

U.S. Cl. 339—93 R **11 Claims**



1. An electrical connector comprising:

a cylindrical first shell having a metal sealing surface with an annular, planar radially disposed end face and an annular, convex corner portion about the outermost terminus of the planar radially disposed end face;

a cylindrical second shell for being coupled with the first shell;

a frusto-conical metal ring having an annular inner edge region immoveably attached about the periphery of the second shell and axially spaced from the sealing surface, and having an annular mating edge region remote from the inner edge region, the mating edge region extending toward the sealing surface and being axially and radially spaced from the inner edge region, the mating edge region circumferentially contacting and the abutting sealing surface when the first and second shells are coupled together in full engagement effectuating resilient axial deflection of the annular mating edge region relative to the annular inner edge region whereby the metal ring is resiliently bent along its length between the inner edge region and the mating edge region, the mating edge region being moveable along the sealing surface;

means for clamping and holding the first and second shell members in mating relationship with the mating edge region of the frusto-conical metal ring pressed in axial deflection relationship against the metal sealing surface of the first shell for forming a continuous annular metal-to-metal seal between the metal sealing surface of the first shell and the annular mating edge region of the metal ring.

4,509,815

TEST HEAD MOUNTING FOR SINGLE OR MULTIPLE TEST HEADS

Gert Fischer, Mulheim, and Dieter Lather, Geldern, both of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Fed. Rep. of Germany

Filed May 14, 1982, Ser. No. 378,117

Claims priority, application Fed. Rep. of Germany, May 29, 1981, 3122036

Int. Cl.³ H01R *3/00*

U.S. Cl. 339—147 P **1 Claim**

1. A mounting assembly for test heads, comprising:

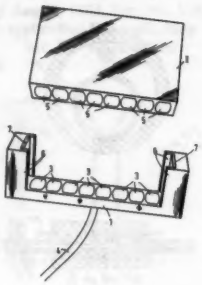
a holding element;

a replaceable test head adapted for receipt by said holding element;

condenser plates firmly fixed in said holding element;

condenser plates in said test head and having the same arrangement as those on the holding element when inserted into said holding element; and

stop elements in said holding element for setting a space between said condenser plates on said holding element



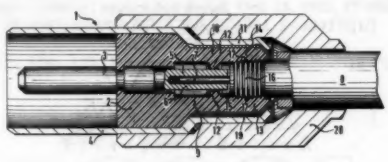
and said condenser plates on said test head and thereby defining a dielectrical distance.

4,509,816

PLUG CONNECTOR FOR CO-AXIAL ELECTRICAL CABLES

Wolfgang Freitag, Arndtstrasse 9-11, 2351 Trappenkamp, Fed. Rep. of Germany

Filed Aug. 31, 1983, Ser. No. 528,001
Int. Cl.³ H01R *17/18*
U.S. Cl. 339—177 R **5 Claims**



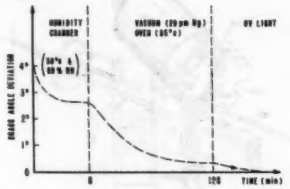
1. In a plug connector for co-axial electrical cables, in which a connector dielectric carrying a sleeve-like external conductor of the connector as well as a central internal conductor of the connector has a portion which, upon connecting the internal cable conductor electrically to a receiving section of the internal conductor of the connector, is pressed against the receiving section, wherein the external connector conductor has a cable connection portion for the outer cable conductor intended to be connected thereto, and wherein the electrical connection of the cable conductors to the connector conductors is established by crimping, the improvement which consists in that said portion of the connector dielectric projects at least partially into an axial area of the cable connection portion of the external connector conductor, in such manner that an inwardly exerted radial force on said connector dielectric portion applied by crimping of the cable connection portion complementarily acts via the connector dielectric portion on at least the radially yielding receiving portion of the inner connector conductor.

4,509,817

METHOD FOR CORRECTING VOLUME-PHASE-GELATIN HOLOGRAMS BRAGG'S ANGLE DEVIATION

Ping-Pei Ho, New Caanan, Conn.; Brian A. Gorin, Lakegrove, N.Y., and Nayana S. Bora, Colorado Springs, Colo., assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 1, 1983, Ser. No. 519,465
Int. Cl.³ G03H *1/02*
U.S. Cl. 350—3.61 **7 Claims**



1. A process for the production of a phase hologram, comprising steps of:

exposing a developed phase hologram to a high concentration of water vapor;

drying the hologram at an elevated temperature and in a vapor pressure reduced vacuum;

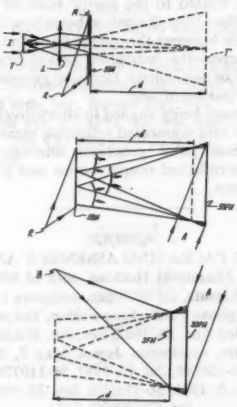
and exposing the dried hologram to an ultraviolet light for reducing the thickness of the hologram.

4,509,818

HOLOGRAM SYNTHESIS

Ivan Prikryl, 2170 Cram Pl. #1, Ann Arbor, Mich. 48105

Filed Dec. 17, 1981, Ser. No. 331,867
Int. Cl.³ G03H *1/08*
U.S. Cl. 350—3.76 **4 Claims**



1. The method of making a final hologram from which can be reconstructed a three-dimensional image of a three-dimensional object without loss of either of two possible independent parallaxes comprising simultaneously reconstructing basic holograms arranged in a two-dimensional lattice without any substantial mutual overlap of these basic holograms, each basic hologram carrying an image of the object as viewed from a different direction; simultaneously reconstructing these basic holograms such that, in some location, the image beams reconstructed from these basic holograms are mutually and substantially fully overlapped; and placing a recording medium for the final hologram in the location where these image beams are mutually and substantially fully overlapped.

4,509,819

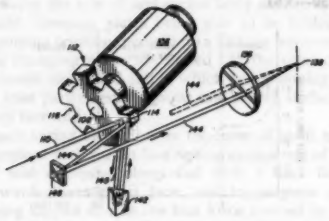
OPTICAL BEAM PULSE GENERATOR

Randy J. Sherman, and Derald F. Hanson, both of Phoenix, Ariz., assignors to Lincoln Laser Company, Phoenix, Ariz.

Continuation-in-part of Ser. No. 320,331, Nov. 12, 1981, Pat. No. 4,433,894. This application Jun. 6, 1983, Ser. No. 501,401

Int. Cl.³ G02B 27/17, 17/00

U.S. Cl. 350—6.7 6 Claims



1. An optical beam pulse generator comprising:

a. a segmented reflecting means aligned to receive an input light beam and including a plurality of circumferentially spaced apart mirror facets defining a gap between each pair of adjacent facets and having a centrally located, vertically oriented axis of rotation, the reflective surfaces of the mirror facets being oriented substantially perpendicular to the axis of rotation of said segmented reflecting means and including mirror facet to axis errors;

b. means for rotating said segmented reflecting means to sequentially reflect the input beam to generate a pulsed beam;

c. means for redirecting the pulsed beam back onto said segmented reflecting means to generate a redirected pulsed beam vertically displaced from the pulsed beam by a distance related to the mirror facet to axis error and laterally offset from the pulsed beam by a distance related to the angle between the mirror facet and the input light beam, wherein the redirected pulsed beam is reflected from each of said mirror facets to generate a pulsed reflected output beam; and

d. the input beam being aligned to alternatively pass through the gaps in said segmented reflecting means such that the optical beam pulse generator alternatively produces pulsed non-reflected output beams and pulsed reflected output beams.

4,509,820

PROTECTIVE PACKAGING ASSEMBLY AND METHOD

Norio Murata; Mitsutoshi Hoshino, both of Mito, and Shinzo Yamakawa, Katsuta, all of Japan, assignors to Nippon Telegraph & Telephone Public Corporation, Tokyo, Japan

Filed Apr. 28, 1982, Ser. No. 373,033

Claims priority, application Japan, May 7, 1981, 56-67605; Jul. 10, 1981, 56-106895; Jul. 17, 1981, 56-110779; Nov. 5, 1981, 56-176508; Nov. 5, 1981, 56-176509; Jan. 25, 1982, 57-9846

Int. Cl.³ G02B 5/14

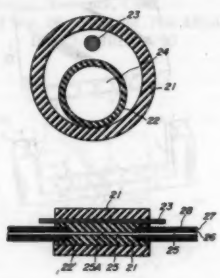
U.S. Cl. 350—96.21 19 Claims

1. A protective packaging assembly for the spliced portions of optical fibers comprising:

an electrically insulative heat-shrinkable tube capable of shrinking in the radial direction thereof:

an extended form of an electrically insulative hot-melt adhesive disposed on the inner side of said heat-shrinkable tube;

an electrical resistance heating element having an electrical resistance distribution in its axial direction and so disposed on the inner side of said heat-shrinkable tube and extending in the axial direction of said heat-shrinkable tube so as to be capable of heating said heat-shrinkable tube and said extended form of hot-melt adhesive, said heating element being capable of shrinking said heat-shrinkable tube by heat and of melting said extended form of hot-melt adhesive around said spliced portions of said optical fibers; and



a space provided in said heat-shrinkable tube for allowing the passage of said optical fibers before heating.

4,509,821

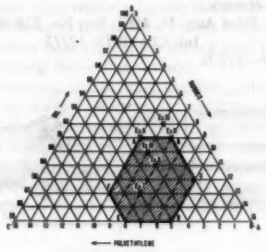
FILLING MATERIAL FOR ELECTRIC CABLE

Richard J. Stenger, Wilmington, Del., assignor to Sun Tech, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 507,955, Jun. 27, 1983, abandoned, which is a continuation of Ser. No. 300,789, Sep. 10, 1981, abandoned. This application Sep. 1, 1983, Ser. No. 528,489

Int. Cl.³ G02B 5/16

U.S. Cl. 350—96.23 8 Claims



1. A cable comprising:

a plurality of conductors contained within a sheath leaving voids between the conductors, and between the conductors and the sheath, and a filling material filling the voids the invention characterized in that the filling material comprises a mixture of:

(X) ASTM Type 103, 104A or 104B, or mixtures thereof, (paraffinic or naphthenic) oil having a minimum sp. gr. of 0.860, a minimum SUS viscosity at 210 degrees F. of 45, a maximum pour point ASTM D 97 of 20 degrees F. and a maximum of 5 percent aromatic oils,

(Y) a styrene-ethylene butylene-styrene block copolymer having a styrene-rubber ratio of approximately 0.2 to 0.5, and

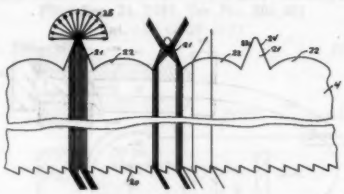
(Z) a linear polyethylene wax having an average molecular weight in the range of from about 1000 to 1500, the ingredients X, Y and Z having relative proportions falling within the shaded area bounded by ABCDEF of the FIGURE.

4,509,822

TRANSPARENT REAR PROJECTION SCREEN

Erik Clausen, and Johannes Clausen, both of Gentofte, Denmark, assignors to Scan Screen A/S, Roskilde, Denmark

Filed Aug. 2, 1983, Ser. No. 519,702
Claims priority, application Denmark, May 10, 1983, 2090/83
Int. Cl.³ G03B 21/60
U.S. Cl. 350—128 6 Claims



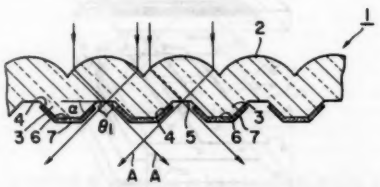
1. Transparent rear projection screen having a lense system for paralleling light arriving from behind and, on the front side of the screen, rectilinear lenses extending in the vertical direction in the position of use of the screen, the sides of the lenses having a small angle of inclination with respect to the normal to the screen and being, at least along a part of their width, totally reflecting to light arriving from behind, and comprising further lenses arranged between the reflecting lenses, wherein the tops of the reflecting lenses being so shaped and the totally reflecting parts of the sides of the reflecting lenses having such an inclination with respect to the normal to the screen and such a width that, at the most, 80% of the light, which from behind enters the reflecting lenses, is emitted through the tops of the reflecting lenses and that, at least, 20% of said light is emitted through the sides of the reflecting lenses.

4,509,823

REAR PROJECTION SCREEN

Yutaro Moriguchi, Tokyo; Makoto Honda, Kamifukuoka, and Akira Izawa, Kawasaki, all of Japan, assignors to Dai Nippon Insatsu Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,297
Claims priority, application Japan, Oct. 15, 1982, 57-180790; Oct. 15, 1982, 57-155928[U]; Dec. 3, 1982, 57-183175[U]
Int. Cl.³ G03B 21/60
U.S. Cl. 350—128 10 Claims



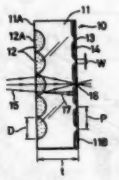
1. A rear projection screen of the type comprising a circular Fresnel lens consisting of a plurality of concentrically circular lens elements and a lenticular lens means having a plurality of corrugated parallel convex lens elements formed over one surface thereof, the other surface of said lenticular lens means being formed with a plurality of parallel projections or protrusions extended in the longitudinal direction of said lenticular lens elements, masking stripes being formed over said parallel projections or protrusions, the improvement wherein the side surfaces of each of said parallel projections or protrusions are so cut that they will not intercept the light rays emerging from said corrugated parallel convex lens elements of said lenticular lens means.

4,509,824

PLATE LENS AND A METHOD FOR MANUFACTURING THE SAME

Tetsuya Yamasaki; Eiji Okuda, and Noboru Yamamoto, all of Hyogo, Japan, assignors to Nippon Sheet Glass Co., Ltd., Osaka, Japan

Filed Jan. 31, 1983, Ser. No. 462,146
Claims priority, application Japan, Feb. 1, 1982, 57-14589; Feb. 1, 1982, 57-14590
Int. Cl.³ G02B 27/00; B05D 5/06
U.S. Cl. 350—167 35 Claims



1. A plate lens comprising:
a transparent base with two flat surfaces;
a plano-convex lens portion which is formed in the vicinity of one of said two flat surfaces of said transparent base to be integrally therewith, which has a refractive index greater than the refractive index of said transparent base, and which has a substantially semicircular section in a direction perpendicular to said two flat surfaces; and
a light-shielding layer which is formed in the vicinity of the other of said two flat surfaces, and which covers the other of said two flat surfaces such that a transparent portion is formed at a position to oppose a central point or line of said lens portion.

4,509,825

DIRECTING AND CONTROLLING THE DISTRIBUTION OF RADIANT ENERGY

Stanley W. Otto, Platte City, Mo.; Jack G. Rhoads, Leawood, and Michel A. Scrivan, Mission Hills, both of Kans., assignors to Hallmark Cards, Inc., Kansas City, Mo.

Filed Jun. 27, 1983, Ser. No. 508,523
Int. Cl.³ G02B 17/00, 27/00
U.S. Cl. 350—259 15 Claims

1. Apparatus for controllably directing radiant light comprising in combination
(a) holding means for a plurality of Fresnel lens light reflective elements adapted to be positioned in the path of radiant light,
(b) a plurality of Fresnel lens light reflective elements held by said holding means, said Fresnel lens light reflective elements having light reflective surfaces of differing angularity with respect to the horizontal plane so that light

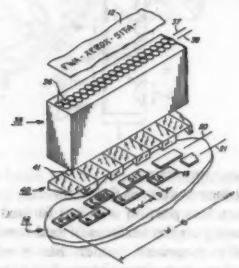
striking said reflective elements is reflected therefrom in different paths to a desired target area.

4,509,826

OPTICAL IMAGE STAGGERING/DESTAGGERING ARRANGEMENT FOR MULTIPLE ARRAY SCANNING SYSTEM

Mehdi N. Araghi, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 11, 1983, Ser. No. 484,092
Int. Cl.³ G02B *5/04, 5/17, 17/00*
U.S. Cl. 350—286 **5 Claims**



1. An optical system for projecting images between an object plane and an image plane, comprising in combination:

(a) an array of individual lens elements disposed between said image plane and said object plane to project at least one image line therebetween;

(b) a plurality of relatively short scanning arrays at one of said image and object planes arranged in two discrete rows, the arrays in each row being separated from one another by a distance no greater than the length of the array with the arrays of said first row being axially offset from the arrays of the second row whereby said arrays form a periodically disconnected scan line pair; and

(c) a prism element associated with each of said arrays and disposed between said lens array and said scanning arrays, said prism elements being arranged in a row with each succeeding prisms reversed whereby to merge the disconnected scan line pair into a single continuous image line for transmission by said lens array.

4,509,827

REPRODUCIBLE STANDARD FOR ALIGNING FIBER OPTIC CONNECTORS WHICH EMPLOY GRADED REFRACTIVE INDEX ROD LENSES

Steven J. Cowen, and Christopher M. Young, both of San Diego, Calif., assignors to The United States of America as represented by the United States Secretary of the Navy, Washington, D.C.

Filed Feb. 2, 1983, Ser. No. 463,097
Int. Cl.³ G02B *7/26*
U.S. Cl. 350—320 **5 Claims**

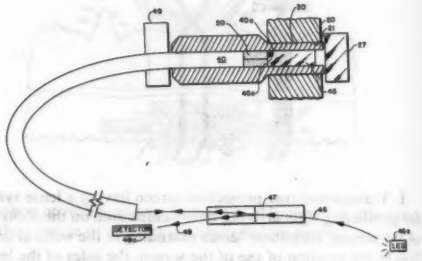
1. A method of fabricating an optically aligned coupling between an optical fiber and a connector having a precision-bored bushing comprising:

autocollimating a projected beam from a laser with a reflected beam emanating from the same laser and reflected from a surface through and parallel with the axis of the precision-bored bushing, the step of autocollimating includes the projecting of a beam from a laser through and parallel with the axis of the precision-bored bushing and disposing a mirror surface separated from and as nearly perpendicular to an axial projection of the axis of the precision-bored bushing as the state-of-the-art allows to reflect the projected beam back over its own path to result in autocollimation of the projected and reflected beams;

inserting a close fitting graded refractive index lens into an alignment ferrule sized to fit in the precision-bored bushing;

exciting the optical fiber by a light source;

positioning the excited optical fiber in the alignment ferrule and on an axially exposed surface of the graded refractive index lens;



monitoring the light intensity reflected through the graded refractive index lens and into the optical fiber from a mirror surface;

changing the fiber's position on the axially exposed surface; and

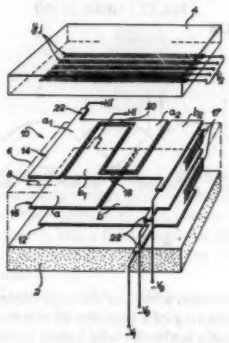
securing the optical fiber at a location on the axially exposed surface where the magnitude of the monitored light is maximum to assure the optically aligned coupling.

4,509,828

MATRIX DISPLAY DEVICE WITH MULTIPLE SCREEN ELECTRODES

Jean F. Clerc, Meylan, and Jacques Robert, Saint Egreve, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jan. 26, 1982, Ser. No. 342,821
Claims priority, application France, Feb. 5, 1981, 81 02219
Int. Cl.³ G02F *1/133*
U.S. Cl. 350—333 **13 Claims**



11. A cell having a controlable optical characteristic in a particular zone, comprising a combination of, a solid layer control electrode separated from a liquid crystal by a plurality of superimposed sets of electrodes of different configurations, said electrodes of different configurations being defined in such a way that a combination of electrodes of different configurations chosen in each of the superimposed sets coincides with said particular zone, each of the electrodes of different configurations of said combination being insulated and each of

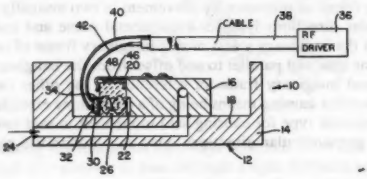
the other electrodes of different configurations being raised to a fixed potential.

4,509,829

AMPLITUDE MODULATOR FOR A HIGH POWERED BEAM OF INFRARED RADIATION

Lauren M. Peterson, Ann Arbor, Mich., assignor to The Environmental Research Institute of Michigan, Ann Arbor, Mich.

Filed Sep. 21, 1981, Ser. No. 304,401
Int. Cl.³ G02F 1/11
U.S. Cl. 350—358 **10 Claims**



1. A method of amplitude modulating a high powered light beam in the megahertz range, said method comprising:

using a laser to generate a beam with 4–40 watts of power;

passing the beam through an acousto-optical crystal having an acoustic transducer on one surface; and

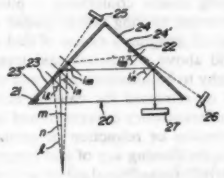
generating a standing acoustical wave front in the crystal generally perpendicular to the beam by applying a drive signal to the transducer at a frequency sufficient to insure operation in the Raman-Nath domain whereby the zeroth diffraction order of said beam is efficiently modulated at twice the frequency of the drive signal.

4,509,830

LIGHT BEAM SEPARATION METHOD

Kiichi Kato; Tohru Musha, and Kenichi Ito, all of Hachioji, Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Feb. 2, 1982, Ser. No. 345,154
Claims priority, application Japan, Feb. 7, 1981, 56-16293
Int. Cl.³ G02B 27/10
U.S. Cl. 350—394 **8 Claims**



1. A method of separating at least two light beams, at least one of which is plane polarized, propagating in substantially the same direction but which propagate with a small angle therebetween, comprising:

making said at least one plane-polarized light beam be incident upon an interface between a first isotropic optical medium having a first refractive index and a second isotropic optical medium having a second refractive index lower than said first refractive index at an incident angle substantially equal to the Brewster angle so that the light beam is substantially totally transmitted through said interface; and

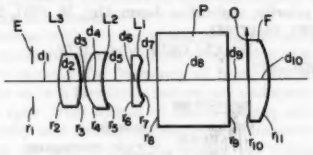
making the other light beam incident upon said interface at an incident angle equal to or greater than the critical angle so that the light beam is substantially totally reflected by said interface.

4,509,831

DIOPTER ADJUSTABLE EYEPIECE USED FOR VIEW-FINDERS OF SINGLE-LENS REFLEX CAMERAS OR THE LIKE

Kimihiko Nishioka, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1982, Ser. No. 355,143
Claims priority, application Japan, Mar. 13, 1981, 56-36143
Int. Cl.³ G02B 3/00, 25/00
U.S. Cl. 350—410 **11 Claims**



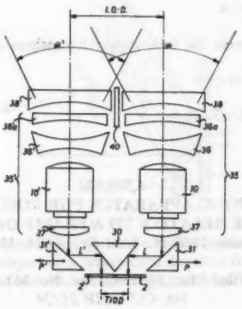
1. An eyepiece used for view finders of single-lens reflex cameras or the like comprising a first lens component of a power negative as a whole having a substantially aplanatic contour, and a second lens component of a power positive as a whole arranged on the side farther from an object than said first lens component and consisting of two lens elements each having a substantially aplanatic contour, at least one of said first lens component and second lens component being able to be moved along the optical axis to adjust the diopter.

4,509,832

OPTICAL ARRANGEMENT FOR PRODUCING TWO ANAMORPHOTICALLY COMPRESSED IMAGES CORRELATED BY AN INTEROCULAR BASE DISTANCE

Jan Jacobsen, Reutern, Fed. Rep. of Germany, assignor to Walter Meier, Birmensdorf, Switzerland

PCT No. PCT/CH81/00135, § 371 Date Jul. 26, 1982, § 102(e) Date Jul. 26, 1982, PCT Pub. No. WO82/02098, PCT Pub. Date Jun. 24, 1982
PCT Filed Dec. 2, 1981, Ser. No. 403,662
Claims priority, application Switzerland, Dec. 8, 1980, 9041/80
Int. Cl.³ G02B 13/10
U.S. Cl. 350—420 **17 Claims**



1. An optical arrangement for producing two anamorphotic images correlated by an interocular base distance, comprising:

first and second basic optical systems spaced laterally by an interocular base distance, each of said basic optical systems having an object space side and an image space side; and

first and second afocal anamorphotic systems mounted adjacent said first and second basic optical systems, respectively, each of said anamorphotic systems having a cylin-

drical negative lens system on the object space side of the respective basic optical system and a cylindrical positive lens system on the image space side of the respective basic optical system.

4,509,833

HIGH VARIABLE MAGNIFICATION WIDE ANGLE ZOOM LENS

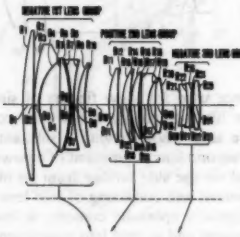
Keiji Ikemori, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 21, 1982, Ser. No. 435,560

Claims priority, application Japan, Oct. 28, 1981, 56-173538; Nov. 5, 1981, 56-177451

Int. Cl.³ G02B *9/64, 15/14*

U.S. Cl. 350—427 **6 Claims**



1. A high varifocal range wide angle zoom objective having the following conditions:

having three lens groups with, from front to rear, a divergent 1st lens group, a convergent 2nd lens group and a divergent 3rd lens group,

zooming being performed by moving said three lens groups, said 2nd lens group moving in only one direction,

letting b_W and b_T denote the distances from the 2nd lens group to an image plane when in the wide angle and telephoto positions respectively, f2, the focal length of the 2nd lens group, c_W and c_T, the distances from said 3rd lens group to the image plane when in the wide angle and telephoto positions respectively, and f3, the focal length of the 3rd lens group, and putting

$$f2=b_T-b_W$$

$$f3=c_T-c_W$$

and wherein the following relationships are satisfied:

$$0.2<f3/f2<0.9$$

$$0.01<f2/|f3|<0.5.$$

4,509,834

POSITIONING APPARATUS FOR POSITIONING A WORKPIECE RELATIVE TO A FRAME OF REFERENCE

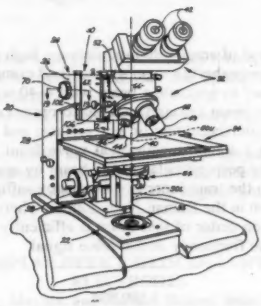
R. W. Hodgson, 1680 N. Vine St., #204, Hollywood, Calif. 90028

Filed Mar. 24, 1982, Ser. No. 361,420

Int. Cl.³ G02B *21/24*

U.S. Cl. 350—521 **14 Claims**

1. Positioning apparatus for positioning a workpiece holder relative to a frame of reference, comprising: an adjustable positioning head including an attachment portion and an adjustably movable coupling portion having connection part means provided with fastening and connection means cooperable for connection to a workpiece holder, said attachment portion and said coupling portion being provided with controllably adjustable relative movement-causing means effectively interconnected therebetween in a manner such as to selectively and controllably cause relative movement of said coupling portion with respect to said attachment portion in mutually perpendicular planes and directions with respect to an imaginary reference center point of an imaginary frame of reference having imaginary mutually perpendicular x, y, and z axes, said movement-causing means effectively interconnected between said attachment portion and said coupling portion being controllably selectively operable to position a workpiece so as to be vertically centered upon, and so as to have a workpiece upper vertical center axis portion thereof centered upon, and vertically aligned with, and coincident with, a workpiece lower vertical center axis portion which is parallel to and forwardly offset from a vertical reference axis of said imaginary frame of reference by movement in two mutually perpendicular directions lying in a horizontal plane and coincident with the imaginary y axis of said imaginary frame of reference in one case and parallel to and offset from the imaginary x axis of said imaginary frame of reference in the other case; said movement-causing means being of a translatory extendable and retractable type for causing said movement in said two mutually perpendicular directions lying in a horizontal plane and



coincident with the imaginary y axis and parallel to and offset from the imaginary x axis to be of a translatory type; said movement-causing means being also arranged to also selectively cause rotary movement of said coupling portion relative to said attachment portion in two mutually different perpendicular vertical planes around the imaginary x axis and the imaginary y axis of said imaginary frame of reference; said movement-causing means comprising a plurality of spaced translatory movement-causing means spaced apart so as to be on both sides of the imaginary center of said imaginary frame of reference and above and below said imaginary frame of reference whereby to be simultaneously and similarly controllably extended or retracted for causing either of said two different kinds of translatory movement and being cooperable for unequal extension or retraction or partial extension and partial retraction for causing any of said types of rotary movement in said two different vertical planes as desired and needed for aligning a workpiece upper vertical center axis portion, when held by a workpiece holder, with a pre-existing workpiece lower vertical center axis portion parallel to and forwardly offset from an imaginary vertical reference axis of said imaginary frame of reference.

4,509,835

THREE DIMENSIONAL CINEMA AND NOVEL PROJECTOR SYSTEM THEREFORE

Clarence E. Adler, 2809 Algonquin Pkwy., Toledo, Ohio 43606

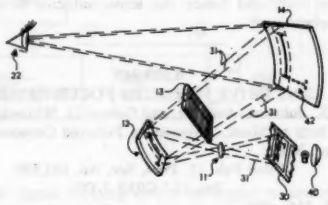
Filed Sep. 6, 1983, Ser. No. 529,223

Int. Cl.³ G03B *21/32*

U.S. Cl. 352—43 **17 Claims**

1. A method of creating viewable images as reflected from a mirror, which images are virtual and of three dimensional character which comprises:

(1) photographing, by suitable camera, a preselected scene but reversing the images as perceived by the camera lens before fixation of the images on a suitable medium;
(2) manipulating the medium to reverse the images;
(3) projecting said reversed images on said medium onto a first parabolic reflector; and



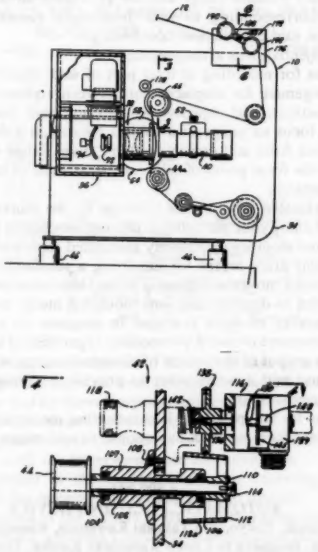
(4) causing the images or light rays reflected from said first parabolic reflector to pass through a light diffusion screen and onto a second parabolic reflector to thereby create the virtual images of three dimensional character.

4,509,836

MULTI FORMAT SHUTTERLESS MOTION PICTURE INSPECTION PROJECTOR

Howard T. La Zare, 10825 Fullbright Ave., Chatsworth, Calif. 91311

Filed Feb. 1, 1983, Ser. No. 462,990
Int. Cl.³ G03B *21/00, 41/00, 21/20*
U.S. Cl. 352—200 **11 Claims**



1. A multi format shutterless inspection projector for motion picture film said projection being capable of rapid continuous projection of entire film frames from margin to margin upon a screen for visual inspection thereof across the entire frame of said film after it is developed and processed to inspect for color, quality and damage including:

a projector housing;

lens means mounted on said housing including light condensing lenses and projecting lenses to project said film frames;

a shutterless film gate interposed between said condensing lenses and said projecting lenses, said gate includes two spaced apart smooth rails forming a film frame aperture therebetween whereby film for inspection will be guided over said rails past said aperture for projection and said space between said rails is of such width as to extend to the marginal edges of each of the said film;

a strobe light means on said housing behind and in line with said condensing lenses and said projecting lenses adapted to be activated and deactivated in fractions of seconds to project said frames;

multi format trigger roller means on said housing which is adjustable during the continuous operation of said projector to activate the frequency of firing said strobe light means as each film frame moves past said aperture dependent upon what format of film is passing said aperture, whereby said frames will each be illuminated and projected on said screen for viewing yet maintaining the motion created by sequentially viewing a series of frames;

said multi format trigger roller means includes a roller mounted on said housing above said shutterless film gate over which film will pass and rotate said roller, a trigger roller assembly associated with said roller and rotatable through rotation of said roller; and

manual means connected to said trigger roller assembly to change the rotational speed of said trigger roller assembly from said roller dependent upon what film format is passing said aperture;

a power source and control circuit forming a part of said strobe light means and said source and control circuit controlled by said trigger means, and

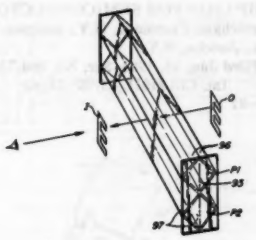
film take up means separate from said projector adapted to pull said film through said film gate to a storage film reel.

4,509,837

REAL IMAGE PROJECTION DEVICE

Michiel Kassies, Rozenstraat 184, 1016PA Amsterdam, Netherlands

Continuation-in-part of Ser. No. 182,550, Aug. 29, 1980, abandoned. This application Feb. 12, 1982, Ser. No. 348,375
Int. Cl.³ G03B *21/06*
U.S. Cl. 353—10 **7 Claims**



1. A symmetrical imaging device for projecting an image of an illuminated object at a preselected distance from said imaging device, said symmetrical imaging device comprising in combination:

an illuminated object;

a matrix of retroreflectors for deflecting light rays from said illuminated object impinging on said matrix of retroreflectors back toward the object in an opposite direction along a same light path as said rays travelled toward said retroreflectors;

a beam splitter in said light path for projecting said image at a place other than said object;

a transparent medium between said beam splitter and said matrix of retroreflectors having an index of refraction

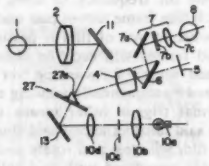
higher than that of air, for guiding said light rays along said light path from said object to said image.

4,509,838

OPTICAL SYSTEM FOR RETINAL CAMERAS

Youich Iba; Ken-ichi Nakahashi, and Masaki Matsubara, all of Hachiouji, Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 260,398, May 4, 1981, abandoned. This application Jan. 31, 1984, Ser. No. 575,580
Claims priority, application Japan, May 8, 1980, 55-59992
Int. Cl.³ G03B *29/00, 9/08*
U.S. Cl. 354—62 **36 Claims**



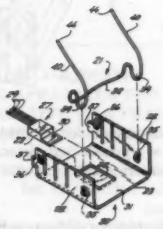
1. An optical system for retinal cameras comprising an objective for forming a retina image of an eye to be inspected, an illuminating optical system including therein a light source to illuminate the surface of the retina, a relay lens for leading to a film surface the retina image formed by said objective, a first reflector which can switch light paths and is arranged between said relay lens and the position of the retina image focused by said relay lens, an eyepiece arranged in the light path of the light reflected by said first reflector, characterized in that said optical system further comprises at least two light path bending second reflectors which are provided between said objective and relay lens, which bend the light path from the objective and then direct it to the relay lens, and an optical element arranged between said objective and relay lens and having one of said second reflectors and a transparent part by which the light from said illuminating optical system can be passed through around said one of said second reflectors.

4,509,839

HEAT DISSIPATOR FOR SEMICONDUCTOR DEVICES

Ronald B. Lavochkin, Commack, N.Y., assignor to IMC Magnetics Corp., Jericho, N.Y.

Filed Jun. 16, 1983, Ser. No. 504,726
Int. Cl.³ H01L *23/02, 23/42*
U.S. Cl. 357—81 **15 Claims**



1. A heat dissipator for use with a semiconductor device which is to be mounted on a support, comprising:

a body of thermally conductive material having a face adapted to contact the semiconductor device, the body including locating means for defining the position of the semiconductor device with respect to the contact face, and the body having an edge beyond which the electrical leads of the semiconductor device extend when the device is located in its predefined position, and

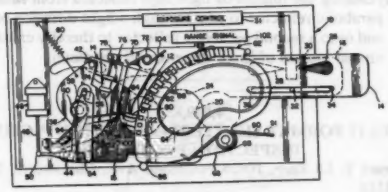
a clip for engaging the body and resiliently clamping the semiconductor device against the contact face, the clip being formed of a single length of bent spring wire, at least one of the free ends of the clip being an attachment element, which projects beyond said edge of the body when the clip is in its operative position on the body, for joining the body and hence the semiconductor device to the support.

4,509,840

LENS DRIVE FOR AUTO FOCUS CAMERA

Bruce K. Johnson, Andover, and George D. Whiteside, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Feb. 21, 1984, Ser. No. 581,539
Int. Cl.³ G03B *7/08*
U.S. Cl. 354—400 **7 Claims**



1. An auto focus camera of the type powered by a source of electrical energy and including means for determining camera-to-subject distance range and for providing an output range signal corresponding to said determined camera-to-subject distance, said camera also comprising:

an objective lens arrangement;

means for mounting at least part of said objective lens arrangement for displacement between a plurality of focal positions, said objective lens arrangement being adapted to focus an image of a subject located at a different distance from said camera within a given range of distances at the focal plane of said camera at each of its said focal positions;

energizeable drive means powered by the source of electrical energy for providing a driving movement by way of a drive member operatively associated therewith;

resilient drive means for imparting a substantially uniform driving movement directly to said lens mounting means in order to displace said lens mounting means between said plurality of focal positions in response to said driving movement of said drive member regardless of variations in the output of the source of electrical energy which would cause said drive member to provide a nonuniform drive movement; and

means for stopping said lens mounting means at the appropriate focal position in response to said range signal.

4,509,841

AUTOMATIC FOCUSING DEVICE

Shinji Sakai, Tokyo, and Takashi Kawabata, Kanagawa, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

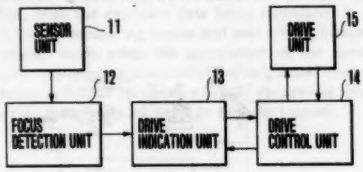
Filed Dec. 10, 1982, Ser. No. 448,693
Claims priority, application Japan, Dec. 17, 1981, 56-204953; Dec. 18, 1981, 56-205786; Dec. 18, 1981, 56-205789
Int. Cl.³ G03B *3/10*
U.S. Cl. 354—400 **18 Claims**

1. An automatic focusing device, comprising:

(a) an automatic focusing circuit which performs distance adjustment by automatically shifting the position of a lens to an in-focus position, said focusing circuit including lens

driving means and said focusing circuit being arranged to have the lens driven by said driving means to a position determined by the output of the focusing circuit;

(b) monitor signal forming means for forming a monitor signal relative to the movement of said lens;



(c) a limit signal forming circuit arranged to detect said monitor signal and to form a limit signal when the monitor signal is not produced within a predetermined length of time, and

(d) reversing means for reversing the lens driving direction of said lens driving means in response to said limit signal.

4,509,842

CAMERA SYSTEM CAPABLE OF FOCUS DETECTION THROUGH AN INTERCHANGEABLE OBJECTIVE LENS

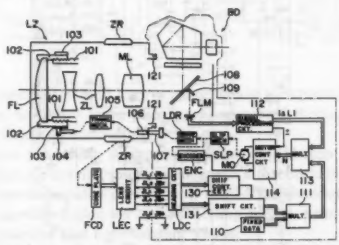
Nobuyuki Taniguchi, Tondabayashi; Norio Ishikawa, Osaka; Yasuaki Akada, Sakai; Takeshi Egawa, Sennan, and Kunio Kawamura, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Jan. 31, 1984, Ser. No. 575,707

Claims priority, application Japan, Feb. 1, 1983, 58-15860; Jun. 23, 1983, 58-113937; Jun. 23, 1983, 58-113938; Jul. 6, 1983, 58-123994; Jul. 25, 1983, 58-136059; Jul. 25, 1983, 58-136060

Int. Cl.³ G03B *17/00, 3/10*

U.S. Cl. 354—402 **30 Claims**



1. In a camera system capable of focus detection by means of receiving light through an interchangeable objective lens, a camera body and an interchangeable objective lens selectively attachable to the camera body comprising:

an opening, located in the camera body for detachably connecting with the interchangeable objective lens;

means, located in the camera body, for receiving light through the opening to produce electric signals;

means, located in the camera body, for processing the electric signals to generate a defocusing information indicative of defocusing degree and defocusing direction relative to an ideal focal plane;

means, located in the camera body, for generating a driving power for automatic focus control, including a first movable member;

means, located in the camera body, for accepting digital data to be transmitted from the interchangeable objective lens, the digital data including a converting information necessary to convert the defocusing degree of the defocusing information into a degree of movement of the first movable member;

means, located in the camera body, for calculating the degree of movement of the first movable member in response to the defocusing degree of the defocusing information and the converting information;

means, located in the camera body, for controlling the generating means to move the first movable member in response to the defocusing direction of the defocusing information and the calculated degree of movement;

means, located in the camera body, for transmitting the driving power of the generating means to the interchangeable objective lens, the transmitting means including a second movable member connectable with the interchangeable objective lens and responsive to the movement of the first movable member;

an optical system, located in the interchangeable objective lens, for forming an image of an object;

means, located in the interchangeable objective lens, for adjusting the focus of the optical system, the adjusting means including a third movable member connectable with the second movable member for a coupled movement therewith;

a read only memory, located in the objective lens, for storing various digital data at a plurality of addresses, the stored digital data including the converting information;

means, located in the interchangeable objective lens, for selectively designating one of the addresses of the read only memory; and

means for sending digital data stored in the designated address to the accepting means,

wherein the converting information is formed as a digital data composed of n-bit of significant digits part and n-bit of floating point coefficient part.

4,509,843

APPARATUS FOR CONTROLLING A MICRO-PROCESSOR UNIT IN A CAMERA

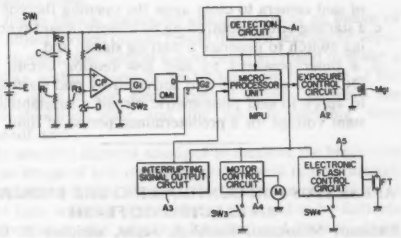
Hiroshi Hasegawa, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 9, 1982, Ser. No. 356,407

Claims priority, application Japan, Mar. 12, 1981, 56-35912

Int. Cl.³ G03B *7/00*

U.S. Cl. 354—412 **8 Claims**



1. In a camera of the type which includes a micro-processor unit operable in a first state where it can operate to carry out an arithmetic operation of data relating to an exposure to be controlled according to exposure factors and store said data in memory, and in a second state where it can hold said memorized data; an exposure control means for controlling a diaphragm device and/or a shutter device by an electromagnetic device according to said memorized data when a shutter releasing operation is conducted; and an electric power source for supplying a voltage to said micro-processor unit, exposure control means and electromagnetic device, and in which said micro-processor unit is operable in said first state when the source voltage applied to it is at least as high as a predetermined voltage level and said micro-processor unit is operable

only in said second state when the source voltage applied to it is lower than said predetermined level, apparatus for controlling said micro-processor unit comprising:

means responsive to initiation of said shutter releasing operation for supplying a set signal to said micro-processor unit that causes said micro-processor unit to change from said first state to said second state;

detection means for detecting the voltage of said power source and generating an output in response to a change of the voltage from a level lower than said predetermined value to a level as high as said predetermined value; and

resetting means for supplying a reset signal to said micro-processor unit that causes said micro-processor unit to change from said second state to said first state in response to the output from said detection means.

4,509,844

PHOTOMETRIC CIRCUIT IN A PHOTOGRAPHIC FLASH DEVICE

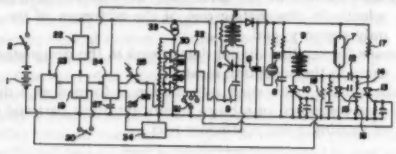
Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 24, 1983, Ser. No. 525,955

Claims priority, application Japan, Aug. 25, 1982, 57-146146

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—416 **11 Claims**



1. In a camera flash device having a photometric circuit to receive light reflected from a subject being photographed and to generate a photometric signal on the basis of which the amount of light to be emitted by a flash discharge tube is controlled, the improvement comprising:

a. a DC—DC converter having high and low tension circuits, said high tension circuit providing DC power to said flash discharge tube;

b. a synchronizing switch operably coupled with the shutter of said camera to close upon the opening thereof;

c. a starting circuit controlling by closure of said synchronizing switch to generate a starting signal; and

d. a timer powered by said low tension circuit of said DC—DC converter and activated by said starting signal to apply to said photometric circuit a substantially constant voltage for a predetermined period of time.

4,509,845

APPARATUS FOR CONTROLLING THE EMISSION OF AN ELECTRONIC FLASH

Kazunori Mizokami, Hachioji, Japan, assignor to Olympus Optical Company Ltd., Tokyo, Japan

Filed Jul. 15, 1983, Ser. No. 514,173

Claims priority, application Japan, Sep. 28, 1982, 57-147589[U]

Int. Cl.³ G03B *15/05*

U.S. Cl. 354—420 **4 Claims**

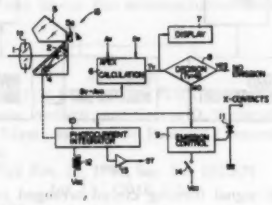
1. An apparatus for controlling the emission of an electronic flash used in a photographic camera of the type in which the photometry of reflection from a film surface is effected, comprising:

a photocurrent integrator for integrating a photocurrent which is produced by a photoelectric transducer element upon which light impinges as it is reflected from the surface of a first blind of a shutter and a film surface as it is exposed during the running of the first blind;

a calculation circuit for calculating an exposure period on the basis of a TTL photometric value which prevails before a shutter release;

a decision circuit to determine if the calculated exposure period is less or greater than a synchronized period of the shutter;

an emission control circuit for controlling the emission of an



electronic flash in accordance with a result of the decision; and

a delay circuit for delaying the initiation of an integrating operation of the photocurrent by a given time interval with respect to the beginning of running of the first blind if the result of the decision indicates that the emission of the electronic flash is allowed.

4,509,846

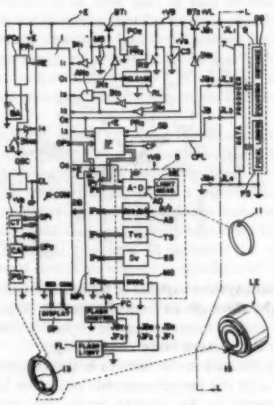
CAMERA SYSTEM

Masaaki Nakai, Nara; Masayoshi Sahara, Sennan, and Nobuyuki Taniguchi, Tondabayashi, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Apr. 21, 1983, Ser. No. 487,206

Int. Cl.³ G03B *7/091, 7/26, 17/00*

U.S. Cl. 354—442 **51 Claims**



1. In a camera system operable by means of a cooperation between a camera body having an opening and a camera accessory to be mounted on the camera body at the opening, the camera body comprising:

means for generating a start signal in response to a manual operation;

means for measuring light through the opening;

means for setting a data of film speed;

means for providing a data depending on the camera accessory;

means for certifying whether or not the mounting of the camera accessory on the camera body is completed; and

means responsive to said certifying means for controlling an exposure data calculation selectively in accordance with a first mode or a second mode, the exposure data being calculated in response to said measuring means, said setting means and said providing means in said first mode when the completion of the camera accessory mounting is certified, with the exposure data being calculated in response to said measuring means and said setting means in said second mode when the completion of the camera accessory mounting is not certified, wherein said controlling means is further responsive to said generating means to start its function in response to said start signal.

4,509,847

AUTOMATIC EXPOSURE CONTROL CAMERA HAVING A LOW BRIGHTNESS WARNING DEVICE

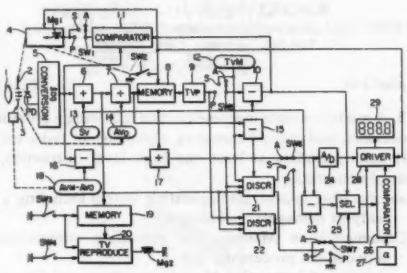
Osamu Maida, Tokyo; Mikio Takemae, Yokohama, and Yuji Okubo, Omiya, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,303

Claims priority, application Japan, May 10, 1982, 57-77737

Int. Cl.³ G03B *7/087, 17/18*

U.S. Cl. 354—442 **17 Claims**



1. A camera in which light-sensing means is exposed to the light from an object to be photographed passed through stop means, said camera including:

(a) means for setting the aperture value of said stop means;

(b) means for driving said stop means in a direction in which the aperture value of said stop means is coincident with the aperture value set by said setting means, prior to the exposure of said light-sensing means;

(c) metering means including a light-receiving element adapted to receive the light from said object passed through said stop means and produce an output corresponding to the intensity of the received light, said metering means producing a metering output corresponding to the brightness of said object on the basis of the output of said light-receiving element;

(d) means for controlling the exposure time of said light-sensing means in order that said light-sensing means may obtain a proper exposure, on the basis of the metering output after said stop means has been driven by said driving means; and

(e) discriminating means for discriminating, prior to the driving of said stop means, that the intensity of the light received by said light-receiving element after the termination of the driving of said stop means is lower than a predetermined value, on the basis of the metering output before said stop means is driven by said driving means, and putting out a discrimination signal.

4,509,848

LIGHT MEASURING DEVICE FOR CAMERA

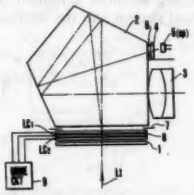
Makoto Katsuma; Akira Hiramatsu, both of Kanagawa; Kazuhiko Arakawa, and Hiroyasu Murakami, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Japan

Filed Jan. 31, 1983, Ser. No. 462,458

Claims priority, application Japan, Feb. 8, 1982, 57-17664; Feb. 8, 1982, 57-17665

Int. Cl.³ G03B *7/099, 17/20*

U.S. Cl. 354—473 **2 Claims**



1. A single-lens reflex camera comprising:

a reticle arranged to allow a light flux coming from an object to be photographed through a photo-taking lens to be imaged thereon;

an electro-optical element of two-layer construction disposed close to said reticle, one layer of said element being arranged to be shiftable between a partially light-shielding state and a non-light-shielding state for shifting a light measuring range, the other layer of the element being arranged to be shiftable between a partially light-shielding state and a non-light-shielding state for the purpose of making displays within a view finder;

control means for controlling the conduction of the first and second layers of said electro-optical element in time-displaced relation, said means operating in three time divisions for display, light metering and exposure, so that when displaying, the second layer is rendered conducting to present a finder display, when metering light, the first layer is rendered conducting in the spot-metering mode, and non-conducting in the average metering mode to perform light metering, and when making an exposure, the first and second layers are rendered conducting, so that said electro-optical element is made in the light shielding state;

view finder optical means for confirmation of an image of the object formed on said reticle through said electro-optical element, said optical means being arranged to make a display within a view finder by selecting the state of the other layer of said electro-optical element between the light-shielding state and the on-light-shielding state thereof; and

a light sensitive element arranged to measure the brightness of an image of said object formed on said reticle through said electro-optical element, the light measuring range of said light sensitive element being arranged to be shiftable according to the selection between said light-shielding state and said non-light-shielding state of the first layer of said electro-optical element.

4,509,849

LIGHT MEASUREMENT DEVICE FOR SINGLE LENS REFLEX CAMERA

Kikuo Momiyama, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 356,509, Mar. 9, 1982, abandoned. This application Feb. 10, 1984, Ser. No. 578,321

Claims priority, application Japan, Mar. 20, 1981, 56-41127

Int. Cl.³ G03B *7/08, 7/00, 17/20*

U.S. Cl. 354—479 **9 Claims**

1. A single lens reflex camera system with a light measuring device, comprising:

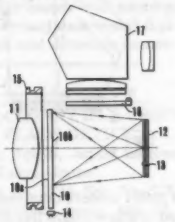
a photographic optical system forming an image plane,

the image plane of the photographic optical system being arranged for receiving an object image sensor,

a mirror arranged to pivot into and out of the path between said photographic optical system and the image plane;

a finder system arranged in a direction along which light coming from an object and passing through said photographic optical system is reflected by the mirror when pivoted into the path between said optical system and the image plane;

a light conducting member arranged between the photographic optical system and the mirror,



said light conducting member having an incident plane and a light projecting plane, said incident plane being arranged in an arc around the light from the object passing through the photographic system and opposing the object image sensor when the object image sensor is located at the image plane for receiving a part of light reflected from the object image sensor when the object image sensor is located at the image plane and subjecting the light to repeated internal reflections within the light conducting member and then projecting the received light from the projecting plane, and

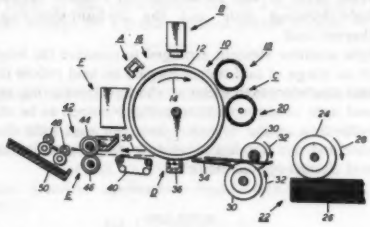
light receiving means arranged near the light projecting plane to receive the light from the light projecting plane.

4,509,850

TWO-COLOR ELECTROPHOTOGRAPHIC PRINTING MACHINE

John W. Weigl, deceased, late of Webster, N.Y. (by Etta R. Weigl, executor), assignor to Xerox Corporation, Stamford, Conn.

Filed Aug. 8, 1983, Ser. No. 520,971
Int. Cl.³ G03G *15/01*
U.S. Cl. 355—4 **12 Claims**



1. An electrophotographic printing machine of the type having a photoconductive member, including:

means for recording a modulated charged area and a continuously charged area on the surface of the photoconductive member;

means for developing the modulated charged area on the surface of the photoconductive member with polar or polarizable marking particles of one color and the continuously charged area on the surface of the photoconductive member with charged marking particles of another color; and

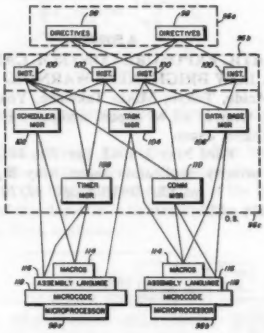
means for transferring the charged marking particles and the polar or polarizable marking particles to a copy sheet simultaneously to form a color highlighted document.

4,509,851

COMMUNICATION MANAGER

Ronald A. Ippolito, Rochester, and Michael T. Dugan, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 28, 1983, Ser. No. 479,623
Int. Cl.³ G03G *15/00*; G06F *1/00*
U.S. Cl. 355—14 C **10 Claims**



5. A multiprocessor machine control including a plurality of processors, said control executing a plurality of tasks, each of said tasks including at least one high level instruction, the control comprising

an operating system, said operating system including a plurality of managers, including a

Communication Manager for providing communication between the processors, and

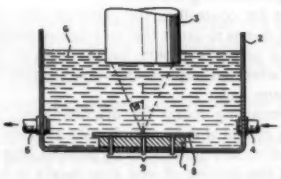
a plurality of Instruction Modules invoking said Communication Manager to execute the high level instructions and provide the communication between processors.

4,509,852

APPARATUS FOR THE PHOTOLITHOGRAPHIC MANUFACTURE OF INTEGRATED CIRCUIT ELEMENTS

Werner Tabarelli, Schlosstr. 5, Vaduz, Liechtenstein (FL-9490), and Ernst W. Löbach, Tonagass 374, Eschen, Liechtenstein (FL-9492)

Division of Ser. No. 194,422, Oct. 6, 1980, Pat. No. 4,346,164. This application Aug. 17, 1982, Ser. No. 408,727
Int. Cl.³ G03B *27/52*
U.S. Cl. 355—30 **4 Claims**



1. An apparatus for the photolithographic printing of a pattern onto a semiconductor substrate, comprising:

a substantially horizontal support for said semiconductor substrate;

means for horizontally moving said support in mutually orthogonal X and Y directions for step-by-step exposure of successive portions of said semiconductor substrate;

a projection lens disposed above said support and said semiconductor substrate for imaging a pattern of a mask upon each of the successive portions of said semiconductor substrate to activate a photosensitive layer thereon, as said portions are aligned with said lens by the movement of said support in said X and Y directions;

a basin carried by and movable with said support, receiving said semiconductor substrate and having an upper rim lying above at least a lower face of said lens whereby said lower face projects into said basin; and

flexible pipe mens for feeding a transparent liquid having a refractive index close to that of said layer into said basin, for removing said liquid from said basin and for maintaining the level of liquid in said basin always above said lower face for imaging of said pattern upon said successive portions under constant conditions of filling of the space between said layer and said face with said liquid, said liquid being capable of wetting said layer and substantially incapable of attacking same.

4,509,853

SYSTEMATIC COLOR REFERENCE

Mark J. McGahan, 625 El Dorado Ave., Oakland, Calif. 94611

Filed Dec. 2, 1982, Ser. No. 446,097
Int. Cl.³ G03B 27/72
U.S. Cl. 355—35 **10 Claims**

1. In an optical printing system including a light source, a filter bay, and an optical printer for exposing graphic transparencies, a systematic reference for standardized color generation and matching, comprising:

a color palette matrix including a plurality of reference transparencies arranged in rows and columns;

said matrix having a hue shift axis wherein hue is progressively shifted from a primary color toward a secondary color by color filters;

said matrix having a value shift axis wherein light density of the hue is progressively shifted from a lighter density to a darker density by neutral density filters; and

each matrix location having a designation from which its hue axis and value shift axis values may be determined according to the code:

AB CD xxE,

wherein:

A=transparency exposure time,

B=optical printer aperture setting,

C=primary color filter color,

D=value of neutral density filter,

xx=amount of hue shift, and,

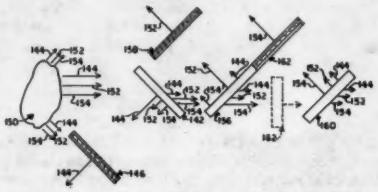
E=second primary color with which the primary color is mixed to shift the hue toward the secondary color.

4,509,854

MEANS AND METHOD FOR COLOR SEPARATION AND REPRODUCTION

Robert E. Pearson, 2000 NW. Wilson, Portland, Oreg. 97209

Continuation-in-part of Ser. No. 399,805, Sep. 24, 1973, Pat. No. 4,355,888. This application Sep. 17, 1982, Ser. No. 419,304
Int. Cl.³ G03B 27/80
U.S. Cl. 355—38 **38 Claims**



1. A means for controlling electromagnetic wave energy to realize desired wave length light waves, said means comprising:

a. a control responsive to light waves;

b. said control in response to said light waves, controlling the electromagnetic wave energy to realize said desired wave length light waves;

c. said desired wave length light waves having a wave length in the range of greater than 3900 A to a wave length in the range of about 4750 A to, approximately 5250 A; and,

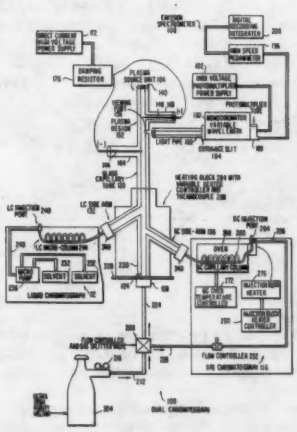
d. a photoscanner for determining the optical density and intensity of said desired wave length light waves and for converting said optical density to pulses of electricity and to pulses of electromagnetic waves.

4,509,855

DUAL LIQUID AND GAS CHROMATOGRAPH SYSTEM

Don D. Gay, Aiken, S.C., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation-in-part of Ser. No. 407,538, Aug. 12, 1982, Pat. No. 4,470,699. This application Feb. 8, 1983, Ser. No. 464,840
Int. Cl.³ G01N 21/73
U.S. Cl. 356—72 **8 Claims**



1. A dual mode direct current plasma spectrometer which comprises, in combination:

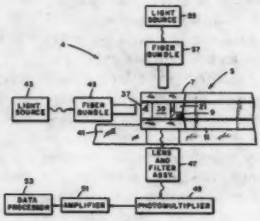
(a) a plasma source unit including
(i) a plasma source, (ii) eluant and gas inlet means, (iii) a plasma sustaining region, and (iv) a plasma viewing means in said region connected to said spectrometer;
(b) a micro-column liquid chromatograph connected to said eluant inlet means;
(c) a gas chromatograph connected to said gas inlet means; and
(d) heater means attached to said plasma source unit, said heater means being adapted to control the temperature of said plasma and the vapor phase from said chromatographs (b) and (c).

4,509,856

ROTOR FOR CENTRIFUGAL FAST ANALYZERS

Norman E. Lee, Knoxville, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 16, 1982, Ser. No. 442,065
Int. Cl.³ G01N *1/10*
U.S. Cl. 356—246 **9 Claims**



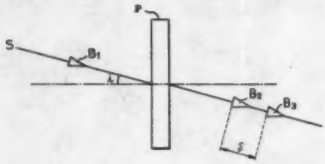
1. In a photometric analyzer of the rotary cuvette type:
a rotor comprising an assembly including a top plate, a bottom plate, and a central plate, the rim of said central plate being formed with circumferentially spaced indentations, and
a ring composed of UV-transmitting material sealably affixed to said rim and defining therewith a circular array of cuvettes.

4,509,857

IMAGING DEVICE, ESPECIALLY FOR PRODUCING IMAGES OF THE EARTH FROM A SATELLITE

Paul Vermande, Toulouse, France, assignor to Centre National d'Etudes Spatiales, Paris, France

Filed May 21, 1982, Ser. No. 380,926
Claims priority, application France, May 27, 1981, 81 10545
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—346 **20 Claims**



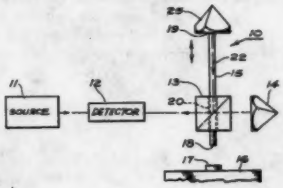
1. An apparatus for producing signals processable to obtain an interferogram of a zone of a heavenly body comprising:
a space vehicle for movement relative to the zone in a given direction;
optical means comprising fixed interferometric means statically located on the space vehicle while receiving light from such zone and while providing, in a plane, successive images of said zone as a result of such movement wherein the interferometric means comprises means for receiving the light and interfering portions of the light from the zone for producing each image as a function of phase differences in the light; and
a plurality of detectors mounted on the space vehicle coplanar with such plane and arranged in a line for successively detecting, at different times, the light intensity of each image of the successive images, each detector being adapted for providing an output signal representative of the light intensity of the image detected by such detector, the signals from all such detectors for a given zone being the signals processable to obtain the interferogram.

4,509,858

COMPACT, LINEAR MEASUREMENT INTERFEROMETER WITH ZERO ABBE ERROR

Robert A. Smythe, Pittsford; Joachim Bunkenburg, Victor, and Gunnar D. Richardson, Fairport, all of N.Y., assignors to GCA Corporation/Tropel Division, Fairport, N.Y.

Filed Jan. 17, 1983, Ser. No. 458,709
Int. Cl.³ G01B *9/02*
U.S. Cl. 356—358 **14 Claims**



1. An interferometer having a light source, a detection system, a beam splitter arranged to divide light from said source into test and reference beams that travel test and reference paths and recombine for detection by said detection system, said interferometer having a measurement axis directed toward a surface of a work piece, and said interferometer comprising:
a. said beam splitter being arranged on said measurement axis with said work piece surface on one side of said beam splitter and said test beam path straddling said measurement axis on an opposite side of said beam splitter;
b. a reference beam retroreflector mounted in said reference path for reflecting said reference beam from said beam splitter back to said beam splitter;
c. a test beam retroreflector mounted in said test path on said measurement axis for reflecting said test beam from said beam splitter back to said beam splitter without causing abbe error;
d. said test beam retroreflector being movable along said measurement axis on said opposite side of said beam splitter from said work piece surface;
e. means movable along said measurement axis for measuring said work piece surface; and
f. said test beam retroreflector being interconnected with said measuring means and movable with said measuring means to determine a distance moved in measuring said work piece surface.

4,509,859

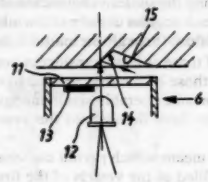
APPARATUS FOR OPTOELECTRONIC EVALUATION OF TEST STRIPS

Ernst Markart, Liebensteinstrasse 14, 8000 München 60; Reinhard Blümel, Strassberger Strasse 23, 8000 München 40, and Holger Eggert, Holzstrasse 20, 8000 München 5, all of Fed. Rep. of Germany

Filed Mar. 22, 1982, Ser. No. 360,352
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1981, 3112028; Mar. 26, 1981, 3112031
Int. Cl.³ G01N *21/47*
U.S. Cl. 356—446 **14 Claims**

1. Test apparatus for optoelectronically evaluating test strips, for example those used in determining blood sugar levels, comprising means for holding a test strip to be evalu-

ated; a light source for illuminating the test strip; a sensor for receiving light which is reflected from the test strip; and calibrating means including a reflector disposed opposite said light source and sensor and defining therewith an elongated gap for



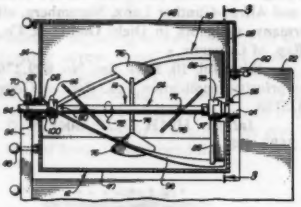
the test strip, said reflector having a reflector surface facing across said gap and being oriented to reflect light which issues from said source away from said sensor while said gap is empty.

4,509,860

DUAL ACTION MIXER

William Lasar, III, Downey, Calif., assignor to Lasar Manufacturing Co., Calif.

Filed May 3, 1983, Ser. No. 491,045
Int. Cl.³ A21C *1/00*; B01F *7/08*
U.S. Cl. 366—99 **31 Claims**



1. A dual action mixer, comprising:

a mixer drum having opposed first and second end walls;

a drive shaft projecting through said first end wall and including a threaded end portion within said drum;

a drive sleeve disposed about said drive shaft and projecting through said first end wall into said drum;

a bearing block supported at said second end wall generally in coaxial alignment with said drive shaft and movable between a normal position projecting into said drum and a retracted position substantially withdrawn from said drum;

a first mixing element including a driven shaft having one end threaded for generally coaxial driving connection with said drive shaft threaded end portion and an opposite end rotatably supported by said bearing block when said block is in the normal position for sufficient axial sliding movement to permit connection and disconnection of said driven shaft with said drive shaft, said first mixing element further including a plurality of first mixing members radiating outwardly from said driven shaft;

a second mixing element including a pair of support hubs rotatably supported generally at opposite ends of said driven shaft, said support hubs being coupled for rotation together by a plurality of outwardly radiating and axially extending second mixing members; and

means for coupling one of said support hubs with said drive sleeve for rotation of said second mixing element when said driven shaft of said first mixing element is drivingly connected to said drive shaft;

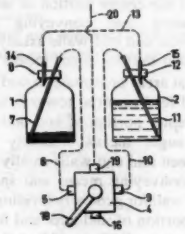
said first and second mixing elements being removable from said drum upon disconnection of said driven shaft from said drive shaft, movement of said bearing block to the retracted position, and uncoupling of said one support hub from driving relation with said drive sleeve.

4,509,861

METHOD OF MIXING ONE SUBSTANCE WITH ANOTHER SUBSTANCE

Göran Sjönell, 11 Askrikevägen, S-181 46 Lidingö, Sweden

Filed Jan. 27, 1983, Ser. No. 461,547
Int. Cl.³ B01F *3/12, 15/02*
U.S. Cl. 366—131 **9 Claims**



9. A method of mixing one substance stored in a first container provided with first closure means with a second substance stored in a second container provided with second closure means, the method comprising the steps of:

(a) communicating interior portions of said first container with a first port of a multi-way valve;

(b) communicating interior portions of said second container below the level of said second substance with a second port of said multi-way valve;

(c) venting said interior portions of said first and second containers through said first and second closure means;

(d) connecting pump means to a third port of said multi-way valve;

(e) adjusting said valve to connect said second and third ports and actuating said pump means to draw some of said second substance into said pump means;

(f) adjusting said valve to close the connection between said second and third ports and to connect said first and third ports and pumping said some of said second substance from said pump means into said first container in mixture with said first substance;

(g) repeating steps (e) and (f) until all of said second substance has been pumped into said first container and has been mixed with said first substance to form a mixture; and

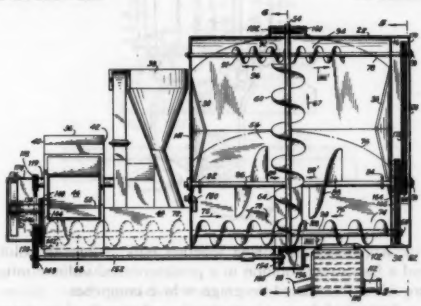
(h) with said valve adjusted to connect said first and third ports, sucking said mixture into said pump means.

4,509,862

FEED PROCESSING SYSTEM

Sam High, Lititz, and Aquila D. Mast, Lancaster, both of Pa., assignors to Feedmobile, Inc., Lititz, Pa.

Filed Aug. 29, 1983, Ser. No. 527,130
Int. Cl.³ B01F *7/08*; B02C *19/00*
U.S. Cl. 366—158 **14 Claims**



1. A system for mixing high moisture industrial and feed materials, in combination, comprising:

a feed mixing tank having opposed upright end walls and opposed side walls secured to opposed top and bottom walls;

vertical auger means rotatably mounted between said top and bottom walls at the center portion of said tank for conveying feed materials upwards in said tank;

horizontal bottom auger means rotatably mounted between said end walls conveying said feed materials towards said auger means at the center portion of said tank;

horizontal agitating and conveying means rotatably mounted between said end walls axially aligned over and spaced from said bottom auger means for agitating said feed materials at areas proximate to said end walls and for conveying said feed material towards said vertical auger means at the center portion of said tank;

horizontal top auger means rotatably means rotatably mounted between said end walls axially aligned over said agitating and conveying means and spaced proximately below said top wall for generally leveling said feed materials at the top portion of said tank and for conveying said feed materials outwardly from said vertical auger means at the center top portion of said tank;

exit means disposed at said bottom wall proximate to said vertical auger means for discharging said feed materials from said tank, and

drive means associated with said tank for rotating said vertical auger means, said bottom auger means, said agitating and conveying means, and said top auger means,

whereby said feed materials are mixed by a general movement of said feed materials from the bottom and middle portions of said end walls of said tank towards the bottom center portion of said tank, upwardly towards the top center portion of said tank, outwardly towards the top portion of said end walls of said tank, by gravitational movement to said bottom and middle portion of said tank, and then to said bottom portions of said tank and to said exit means.

4,509,863

APPARATUS FOR MIXING MILK WITH FLAVORING AND FLUORIDE

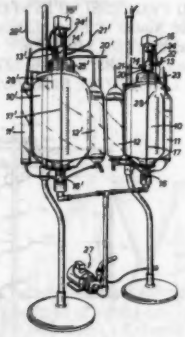
Edgar W. Borrow, Padnell Grange, Cowplain, Portsmouth, Hampshire, England

Filed Jun. 25, 1984, Ser. No. 623,937

Claims priority, application United Kingdom, Jun. 23, 1983, 8317059

Int. Cl.[3] **G05D** *11/00;* **B01F** *15/04*

U.S. Cl. 366—162 **9 Claims**



1. Apparatus for mixing together milk, a fluoride solution and a flavouring solution in a predetermined volume ratio to provide a fluoridated beverage, which comprises

a first set of three at least translucent vessels whose internal volumes are in the same ratio as the volume ratio of the three liquid components of the final beverage, having

outlet valve means of each vessel operable to permit the three liquids to flow out of the three vessels simultaneously and to mix together,

inlet valve means operable simultaneously to shut off the flow of the three liquids into the vessels, and

means coupling the outlet valve means and the inlet valve means, which enables closure of the inlet valve means to permit outflow through the outlet valve means,

a second set of three at least translucent vessels substantially identical to those of the first set and having

inlet valve means, operable simultaneously to shut off the flow of the three liquids into the vessels of the second set,

outlet valve means which permit the vessels of the second set to be filled as the vessels of the first set are emptied and vice-versa, thus providing a substantially continuous supply of the beverage

and means coupling the outlet valve means of the second set and the inlet valve means of the second set which enables closure of the inlet valve means to permit outflow through the outlet valve means,

the at least translucent vessels enabling an operator to check that the vessels are filled to a selected common level before the contents are discharged.

4,509,864

PROGRAM PLATE FOR A TIMER

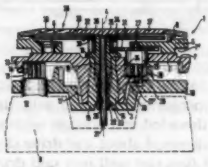
Oskar Oellig, Nuremberg; Horst Grimmer, Nuremberg-Oberasbach, and Alfred-Günther Lunz, Nuremberg, all of Fed. Rep. of Germany, assignors to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Jul. 10, 1984, Ser. No. 629,276

Claims priority, application Fed. Rep. of Germany, Jul. 15, 1983, 3325588

Int. Cl.[3] **H01H** *43/10;* **G04F** *8/00*

U.S. Cl. 368—108 **9 Claims**



1. In a program plate for a timer including setting means arranged along the circumference of the program plate for the determination of a switching program, said program plate being rotatably connected with a clockwork drive mechanism for driving said program plate, and an additional time display operable by a further drive mechanism, said additional time display possessing a higher timewise resolution than the program plate, and said further time display being integrated into the program plate; the improvement comprising a display disc centrally located and rotatably supported within the peripheral surface extent of the program plate for the higher resolved additional time display; said further drive mechanism being supported in the program plate; and the display disc being operated through the differential speed between the program plate and a housing portion of the clockwork drive mechanism by said further drive mechanism.

4,509,865

ELECTROMAGNETICALLY-INDUCED ROCKING CLOCK

Kuo-Chin Chu, 10-4 Fl., No. 62, Chang Chun Rd., Taipei, Taiwan

Continuation-in-part of Ser. No. 554,281, Nov. 22, 1983,. This application Apr. 20, 1984, Ser. No. 602,111

Int. Cl.[3] **G04B** *15/00*

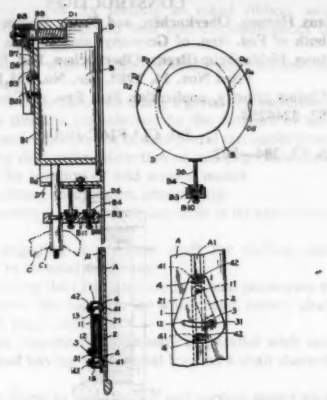
U.S. Cl. 368—134 **2 Claims**

1. An electromagnetically-induced rocking clock having a pendulum-adjustment means which comprises:

a casing adjustably fixed on said pendulum and being formed with an arcuated hole thereon;

an adjustable weight pivotedly fixed on said casing;

a transversely adjusting screw passing through said arcuated hole formed on said casing and being fastened by nut **31** to definitely fix said weight on a specific point on said casing so that said screw and said weight can be moved either rightward or leftward to obtain a sharply vertical pendulum; and



two longitudinally adjusting screws, formed on said casing, each adjusting screw being formed with an extension engaged with a vertical lengthy groove formed on said pendulum so that said casing may be vertically adjustably fixed on said pendulum by fixing a nut on each said longitudinally adjusting screw so as to adjust the gravity center and the arm of force of said pendulum.

4,509,866

WATERPROOF WATCHCASE WITH MULTI-LAYERED RESIN-COATED GLASS

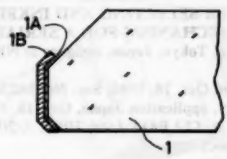
Gen Mitamura, Tokyo, Japan, assignor to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Feb. 7, 1984, Ser. No. 577,862

Claims priority, application Japan, Feb. 7, 1983, 58-18512

Int. Cl.[3] **G04B** *37/00*

U.S. Cl. 368—296 **20 Claims**



1. A watchcase having a glass mounted thereon, the glass having an outer peripheral portion coated with more than two superimposed layers of resin of different hardness.

4,509,867

ELECTRONIC TIMEPIECE MOVEMENT

Willy Cleusix, Le Landeron, and Francois Nikles, Cornaux, both of Switzerland, assignors to Ebauches Electroniques S.A., Switzerland

Continuation of Ser. No. 253,576, Apr. 13, 1981, abandoned. This application Dec. 22, 1983, Ser. No. 564,747

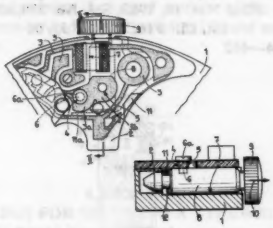
Claims priority, application Switzerland, Apr. 30, 1980, 3329/80

Int. Cl.[3] **G04B** *29/00*

U.S. Cl. 368—321 **6 Claims**

1. In an electronic timepiece movement having a base plate, a substrate plate supported on said base plate and a printed electrical circuit deposited on said substrate plate which includes a pair of electrically conductive leads each for specifically initiating the same timepiece setting functions by means of a manually actuable control mechanism which establishes electrical contact selectively with individual ones of said leads for performing said functions, the herein invention comprising:

1. said control mechanism including an electrically conductive contact member mounted on the substrate plate in electrical connection selectively with one of said leads of the printed circuit;
2. said base plate and substrate plate being spaced apart to form a radially extending passage opening to exterior of the timepiece;



3. said mechanism including means axially movable in said passage and protruding outwardly from the passage for initiating said movement manually from exterior of the timepiece;
4. said mechanism also including an electrically conductive member selectively actuated by movement of said means into electrical contact with said contact member whereby to initiate said timepiece setting functions through the lead with which said contact is connected;
5. said printed circuit having said leads located in two independent positions on said substrate plate; and
6. said means being movable multi-directionally on its axis for selecting the one of said leads which is electrically connected to the contact member.

4,509,868

TEMPERATURE INDICATING DEVICE FOR A COOKING POT AND DEVICE-POT COMBINATION

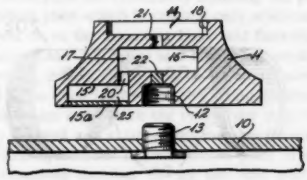
Mario Ronconi, Via Goethe, 132, 24100 Bergamo, and Renzo Civitani, Via Conciliazione, 29, 20031 Cesano Maderno, both of Italy

Filed Jun. 8, 1982, Ser. No. 386,360

Claims priority, application Italy, Jun. 15, 1981, 22084/81[U]

Int. Cl.[3] **G01K** *13/00, 7/14*

U.S. Cl. 374—141 **6 Claims**



1. A thermometer device for a cooking receptable, comprising in combination:

means, coacting with at least a portion of said cooking receptable, for sensing variations of temperature within said receptable;

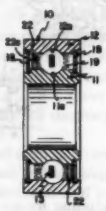
transducer means, operatively connected with said sensing

means, for converting said temperature variations attained during said sensing to corresponding electrical variations; A/D (analog-to-digital) circuit means, operatively associated with said transducer means, for converting said electrical variations from analog signals to digital signals; and means, operatively associated with said A/D means, for displaying said temperature variations according to said electrical variations and displaying said temperature variations as digital display variations.

4,509,869
SELF-GREASING BEARING

Kenneth R. Johnston, 2517 43rd St., Bellingham, Wash. 98226

Filed Nov. 10, 1983, Ser. No. 550,369
Int. Cl.³ F16C *33/58, 33/66*
U.S. Cl. 384—462 6 Claims

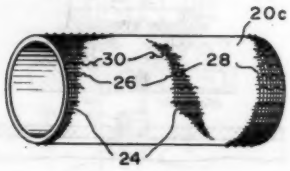


1. A bearing comprising, concentric inner and outer races, at least one of said races adapted to be rotatable, an annular cage member disposed concentrically between said races, said cage member having a plurality of spaced apart pockets, rolling elements received in said pockets and in rolling engagement with said races, lubricant consisting of grease between the races and over said cage member and rolling elements, annular seal members spaced outwardly of said cage member and rolling elements and between the races to prevent leakage of said lubricant, and means on one of the races for directing lubricant from locations or ordinary build-up back toward the cage member and rolling elements thereby maximizing lubrication of the bearing, said means including at least one diverter wiping the lubricant from the seal areas and forcing it back toward said rolling elements.

4,509,870
PLASTIC SLIDE BEARING

Kiyozi Taki, Gamagouri, Japan, assignor to Kabushiki Kaisha Miura Kumihimo Kogyo, Gamagouri, Japan

Filed Sep. 7, 1983, Ser. No. 529,961
Claims priority, application Japan, May 16, 1983, 58-85654
Int. Cl.³ F16C *33/20*
U.S. Cl. 384—296 3 Claims



1. A plastic slide bearing comprising an inner cylindrical member and an outer cylindrical member of fiber reinforced thermosetting resin coaxially and integrally formed with the inner cylindrical member, characterized in that said inner cylindrical member is a cylindrical cloth woven by warps of fluoride fibers and loop threads and wefts of non-fluoride fibers, and loops formed in the loop threads of said non-fluoride fibers are provided only on the external surface of the cylindrical cloth to firmly grip the outer cylindrical member of fiber reinforced thermosetting resin.

4,509,871
PLAY-FREE ANTI-FRICTION BEARING CONSTRUCTION

Klaus Herzog, Oberkochen, and Franz Szenger, Konigsbronn, both of Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim/Brenz, Oberkochen, Fed. Rep. of Germany

Filed Nov. 14, 1983, Ser. No. 551,173
Claims priority, application Fed. Rep. of Germany, Nov. 30, 1982, 3244258
Int. Cl.³ F16C *19/06*
U.S. Cl. 384—502 11 Claims

1. A radial anti-friction bearing having an outer ring (4; 14; 24; 44; 54; 64) which has a split (7) or break transverse to the running direction of anti-friction elements (3; 13; 23; 43; 53; 63) and having clamping rings or wires (5; 25; 45; 55; 65) placed over the outer ring, characterized by the fact that

(a) the inner ring of the bearing is formed directly by a shaft (1; 11; 21; 41; 51; 61) having an inner raceway developed therein,

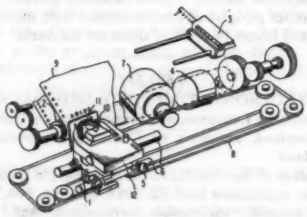
(b) the diameter of the anti-friction elements is so selected that the slit (7) or break in the outer ring is characterized by a finite gap in the clamped condition of the bearing, and

(c) the outer ring is thin-walled and is bedded by jointing means in the bore of an outer bearing part (6, 16).

4,509,872
CHARACTER SELECTING AND INKED RIBBON FEEDING MECHANISM FOR A SERIAL PRINTER

Jun Shimogawara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 542,970
Claims priority, application Japan, Oct. 18, 1982, 57-182345
Int. Cl.³ B41J *1/44;* H02K *7/20*
U.S. Cl. 400—144.1 15 Claims



1. A serial printer, comprising:

a print thimble having a set of elastic fingers disposed in the form of a petal, and a plurality of characters arrayed along plural circumferences of the set of said elastic fingers, said

circumferences having different heights in the vertical direction;

a first rotary motor having a shaft for rotating said print thimble, said shaft being allowed to move in its axial direction;

a plane cam engaging said shaft of said first motor, said cam enabling said shaft to shift in its axial direction in response to cam rotation;

a second rotary motor for feeding an inked ribbon, said inked ribbon being disposed near said circumferences of said print thimble; and

gear means coupled with the shaft of said second motor and said plane cam;

wherein the characters arrayed along a given circumference of said print thimble are selected by the rotation of said first motor, and wherein one of said plural circumferences arrayed along the vertical direction of said print thimble is selected by the rotation of said second motor.

13. A motor shifting mechanism, comprising:

a first motor having a rotary shaft movable in its axial direction;

a plane cam engaging said rotary shaft for shifting said rotary shaft in its axial direction;

means for detecting the rotational angle of said plane cam in order to detect the location at which said rotary shaft engages said plane cam;

a second motor disposed substantially in parallel with said first motor and having a rotational load on a shaft thereof; and

a gear member fitted to said shaft of said second motor such that said gear member engages said plane cam via a clutch mechanism;

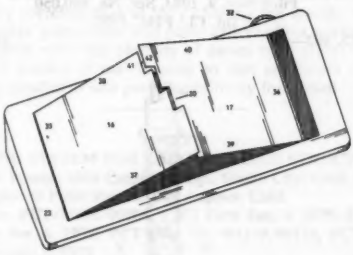
said second motor turning in one direction to move said rotary shaft of said first motor in its axial direction, and turning in the other direction to drive said rotational load of said second motor.

4,509,873

ALPHANUMERIC SECTION OF OFFICE MACHINE KEYBOARDS

W. Kenneth Ryan, c/o William F. Ryan, 3303 Lakeview, Cincinnati, Ohio 45211

Filed May 5, 1983, Ser. No. 491,752
Int. Cl.³ B41J *5/08*
U.S. Cl. 400—489 **1 Claim**



1. In a keyboard for typewriters, terminals and similar machines in which keys are arranged in general accord with International Organization for Standards recommendations for the alphanumeric sections of keyboards for office machines, an improvement comprising:

one left mounting board and one right mounting board, said mounting boards having front and rear edges, the mounting boards together having adjacent ends and outermost ends, and together corresponding to a standard keyboard, and said left and right mounting boards so shaped that they can be fitted with key contacts and keys as actuated by the left and right hands, respectively, in touch typing;

a hinge between and connecting said left mounting board and right mounting board, said hinge in a position approximately equidistant from the outermost ends of said mounting boards and likewise approximately equidistant from the front and rear edges of said mounting boards, said hinge permitting the adjacent edges of said mounting boards to be raised vertically at said hinge mounting position;

a second hinge connecting the outermost end of one of the said mounting boards to the keyboard chassis or case;

a means of locating the outermost end of the other said mounting board, permitting both lateral and pivotal movement;

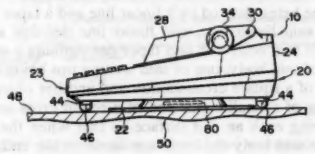
a means of maintaining the lateral position of the mounting board outermost end that is permitted lateral and pivotal movement.

4,509,874

APPARATUS FOR SECURING A TYPEWRITER

Yutaka Hira; Yoshitaka Ukai; Yoshihide Akuzawa, all of Shizuoka; Osamu Aoki, Numazu, and Saburo Shimatani, Funabashi, all of Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 508,064
Claims priority, application Japan, Mar. 3, 1983, 58-30972[U]
Int. Cl.³ B41J *29/02*
U.S. Cl. 400—691 **7 Claims**



1. An apparatus for securing to a typewriter-mounting base a typewriter comprised of a case which includes a bottom plate and a wall having an opening for accessing printing means contained in the case, a cover which is movably attached to said case for at least partly closing said opening, said cover when opened, exposing a portion of said bottom plate facing the printing means, comprising:

locking means on at least one of said case and said cover for locking said cover to said case in a state wherein said cover is closed; and p1 fastening means associated with said bottom plate for detachably fastening the portion of said bottom plate which is exposed only when said cover is opened on to the mounting base, said fastening means being accessible only when said cover is opened;

said fastening means comprising a fastening member arranged to be fixed in advance at a fixing position on the mounting base and which the typewriter is to be subsequently secured, and a connecting member for connecting said fastening member to said bottom plate of said case, said connecting member having one end portion connected to said fastening member, said one end portion being completely enclosed by said fastening member and said mounting base, said connecting member not being accessible from the outside of the typewriter, said connecting member having another end portion connected to the exposed portion of said bottom plate, access to said other end portion being positively prevented by said cover when said cover is closed.

4,509,875
FELT PEN HAVING TWO END CAPS

Koichi Shintani, Tokyo, Japan, assignor to Colleen Pencil Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1982, Ser. No. 451,541
Claims priority, application Japan, Nov. 30, 1982, 57-180032[U]
Int. Cl.³ B43K 9/00, 8/02, 27/00
U.S. Cl. 401—34 3 Claims

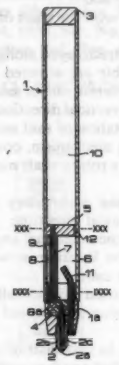
1. A felt pen, comprising a bar-shaped hollow body; an ink-impregnated sponge supported within said body, said body having two opposite ends; two writing tips mounted at said opposite ends, respectively, in said body; and two caps detachably-attachable to said body at said opposite ends, respectively to close the respective tips, said body having an outer shape, said shape being defined by a linear line and a taper line merging into said linear line, said linear line defining a first grip portion of said body and said taper line defining a second grip portion of said body, one of said writing tips being of a larger size and of a square cross-section and another of said writing tips being of a smaller size and of a round cross-section, said caps having each an end surface so that when the cap is attached to said body the latter can stand on the end surface of the respective cap, one of said caps being of a larger outer diameter and another of said caps being of a smaller outer diameter, one of said caps being formed with one groove and another of said caps being formed with another groove, the cap of the smaller outer diameter being adapted to be mounted on the cap of the larger outer diameter such that said another cap is partially inserted into the respective groove of said one cap, the cap of the larger outer diameter being adapted to be mounted on the cap of the smaller outer diameter.

4,509,876
WRITING INSTRUMENT WITH OVERFLOW CHAMBER AND RETURN TO SUPPLY

Jiro Hori, 2-202, Glorious Manshions, 33-40, 3 chome Senbacho, Kawagoe-shi, Saitama-ken, Japan, assignor to Kotobuki & Co., Kyoto and Jiro Hori, Saitama, both of, Japan

Filed Jun. 14, 1983, Ser. No. 504,314
Claims priority, application Japan, Jun. 15, 1982, 57-102476
Int. Cl.³ B43K 7/08, 7/10, 5/18
U.S. Cl. 401—217 10 Claims

1. A writing instrument using a low viscosity ink, comprising an ink occluding member having a strong capillary action, said ink occluding member being disposed inside a pen member mounting portion of a body of said writing instrument so that it is fluidly connected with said pen member for communication of ink therewith; a partitioning portion disposed in an inner position spaced from said ink occluding member for partitioning the interior of the body into an empty chamber of a small capacity and an ink chamber of a large capacity; an air-liquid exchange passage connecting for communication of ink between said ink chamber and said ink occluding member through said partitioning portion, said air-liquid exchange passage being normally closed with ink and adapted to open upon the sucking out of ink when writing, said air-liquid exchange passage having both strong and weak capillary actions; a notched portion formed in a fore end of said air-liquid exchange passage for communication between said passage and said empty chamber in the vicinity of said ink occluding member so that air can be introduced; an air intake tube disposed in the fore end of said writing instrument body for introducing

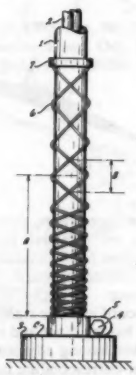


outside air into said empty chamber, with an inner open end of said air intake tube being positioned so as not to be blocked with the stored jet ink extruded into said empty chamber; and further including at least one ink return passage between said empty chamber and said ink chamber having a strong capillary action, said ink return passage being formed between said partitioning portion and the inner wall surface of the body to thereby enable return of ink from said empty chamber to said ink chamber during sideways and inverted orientations of said writing instrument.

4,509,877
TAPERED TORQUE STRAIN RELIEF COUPLING

Sidney S. Sobin, 336 13th St., Del Mar, Calif. 92014, and Daniel J. Netto, 153 N. Vendome St., Los Angeles, Calif. 90026

Filed Nov. 9, 1983, Ser. No. 550,050
Int. Cl.³ F16C 1/00
U.S. Cl. 403—41 15 Claims



1. Reinforcing means adapted for reinforcing a flexible member extending from a rigid member, said reinforcing means comprising a plurality of strands braided in the shape of a

hollow tube adapted to be disposed around the flexible member, said strands being closedly braided adjacent to the rigid member and progressively more openly braided around the flexible member as the distance along the flexible member from the point of attachment between the flexible member and the rigid member increases.

4,509,878

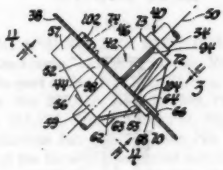
WINDSHIELD WIPER TRANSMISSION

Bruce A. Bryson, Arcanum, and Jeffrey J. Buschur, Xenia, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Jun. 17, 1983, Ser. No. 505,179

Int. Cl.³ F16B *9/00;* **G12B** *9/00;* **B60S** *1/08;* **B23P** *19/02*

U.S. Cl. 403—71 **5 Claims**



1. In a mounting for a windshield wiper pivot shaft on a vehicle body panel for rotation about an axis of said panel, the combination comprising, a transmission housing having a base defining a base surface with a tower projecting therefrom, means defining a pivot shaft support bore through said tower on an axis of said housing, aperture means on said panel defining a pivot edge spaced from said panel axis in one direction and a plurality of datum edge points including one datum edge point on the opposite side of said panel axis from said pivot edge and a pair of datum edge points angularly spaced about 90° on opposite sides of said one datum, edge point, means on said housing defining a lip at an edge of said base engageable on said pivot edge and cooperable therewith in defining a fulcrum about which said housing pivots to an installed position wherein said base surface abuts said panel and said tower projects therethrough with said housing axis coinciding with said panel axis, and means defining a plurality of protuberances on said base surface spaced from said housing axis distances generally corresponding to but exceeding the spacing of said datum edge points from said panel axis to effect interference engagement with said plurality of datum edge points in said installed portion of said housing so that movement of said housing parallel to said panel is positively foreclosed.

4,509,879

JOINING SYSTEM FOR TRIANGULATED STRUCTURES

Peter J. Pearce, 3838 Carpenter Ave., Studio City, Calif. 91604, assignor to Peter Pearce, Los Angeles, Calif.

PCT No. PCT/US78/00100, § 371 Date Jun. 4, 1979, § 102(e) Date Jun. 4, 1979, PCT Pub. No. WO79/00176, PCT Pub. Date Apr. 5, 1979

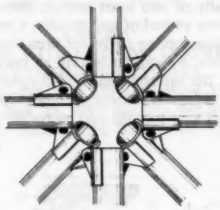
PCT Filed Oct. 3, 1978, Ser. No. 245,551

Claims priority, application United Kingdom, Oct. 3, 1977, 41000/77

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—172 **15 Claims**

1. A triangulated structural assembly including a plurality of elongated structural elements, each of which elements is permanently provided with at least two integral connector means at each end thereof and in which each elongated structural element is pivotally connected directly to at least one further structural element in non-colinear alignment by their connector means about a pivot axis which is transverse to the longitudinal axes of the elongated structural elements, said pivot axis being displaced from the central axis of said structural element; each connector means comprising an axially elongated attaching portion about said structural element and an assymetrical



radially extending hinging portion along the length thereof and secured to said structural element and including a bore for a pivot pin.

4,509,880

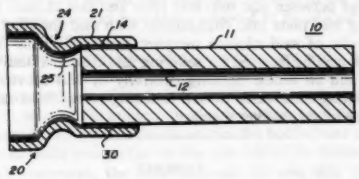
VERY HIGH HERMETICITY GLASS TO METAL SEAL

David B. Wamstad, Roseville, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Mar. 30, 1981, Ser. No. 248,135

Int. Cl.³ F16B *11/00*

U.S. Cl. 403—179 **4 Claims**



1. A highly hermetic glass to metal seal comprising:

a round cylindrically shaped glass member having an outside diameter;

a tubular sleeve of resilient metal having a first end with an inside diameter slightly larger than said outside diameter of said glass member, and said sleeve having a reduced diameter portion adjacent to said first end, said reduced diameter portion having an inside diameter slightly smaller than said outside diameter of said glass member;

a thin metalization layer having a first thin film layer of a titanium-tungsten alloy, a second thin film layer of nickel and a third thin film layer of gold, said metalization layer being on a first end of said glass member, said metalized first end of said glass member being inserted into said first end of said tubular metal sleeve so as to define an annular gap therebetween and into abutting relation with said reduced diameter portion of said sleeve so as to form a capillary gap therewith; and

solder mean flowed while in a molten form into said annular gap pursuant to a pulling-like force of said capillary gap.

4,509,881

SPINDLE MOUNTING BASE

Thomas M. Welch, Cincinnati, Ohio, assignor to Duplex Lighting, Inc., Cincinnati, Ohio

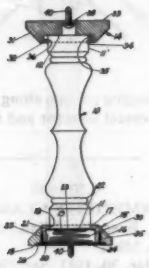
Filed Jun. 9, 1982, Ser. No. 386,691

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—229 **5 Claims**

1. A base for releasably securing a spindle in a desired position, the spindle having planar top and bottom surfaces, said base comprising a socket member having substantially parallel,

generally planar inner and outer surfaces when in the installed position, the perimeter of said inner surface in the installed position being less than the perimeter of said outer surface, an opening centrally of said inner surface dimensioned and configured to receive an end of said spindle, a passage centrally of said outer surface having a greater area than said opening in said inner surface, a shoulder having an inwardly facing right angle defining the intersection of said opening and said passage, a plate within said passage having substantially the same configuration as said passage and movable therein into abut-



ment with said shoulder, a planar closure member secured to said outer surface of said socket member and underlying said passage when in the installed position, spring means in said passage between said movable plate and said closure member urging said plate into engagement with said shoulder, a bore centrally of said closure member through which fastening means may be inserted for securing said base in a desired location, and an access opening centrally of said movable plate facilitating installation of said fastening means from said inner surface of said socket member.

4,509,882

JOINT FASTENER FOR THE ASSEMBLY OF MOLDINGS

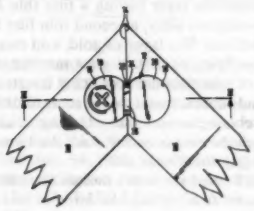
Karl Lautenschläger, Jr., Reinheim, Fed. Rep. of Germany, assignor to Karl Lautenschlager KG Mobelbeschlagfabrik, Reinheim, Fed. Rep. of Germany

Filed Sep. 30, 1983, Ser. No. 537,827

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236719

Int. Cl.³ F16B *7/00*

U.S. Cl. 403—402 **16 Claims**



1. A clamping fastener for moldings, especially for cornice moldings on furniture, comprising: two plug-like fastening elements respectively insertable into two recesses in two moldings to be joined, means for respectively drawing said fastening elements together or apart, said fastening elements each having the external shape of a substantially cylindrical insert body provided on one side with a flat running parallel to the center axis of the cylindrical insert body, at least one of said insert bodies having an opening extending radially into said one insert body substantially at right angles from its flat, a coupling bar projecting substantially at right angles from the flat of the other insert body and matingly engaging said opening, said one insert body having a first bore with an axis which runs parallel to said central axis, said first bore opening into at least one of the end faces of said one cylindrical insert body, said coupling bar having a second bore adapted to be aligned with said first bore, and a turn pin having sections journaled in said two bores, said section in said second bore in the coupling bar being offset excentrically from said section journaled in said first bore in said one insert body.

4,509,883

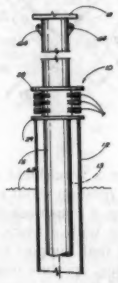
RIG PILING CLAMP APPARATUS

Emile Thibodeaux, Rte. 3, Box 512, and Robert Thibodeaux, 140 Samuel Dr., Lot 19, both of Eunice, La. 70535

Filed May 11, 1983, Ser. No. 493,552

Int. Cl.³ E02D *7/00*

U.S. Cl. 405—232 **7 Claims**



1. An apparatus for engaging and disengaging a rig piling being lowered into a rig jacket leg, which comprises:

a. first and second shell portions having continuous side walls and hingedly attached at a common edge, said shell portions supported on said jacket leg;

b. means interconnecting said first and second shell portions along a second edge for forcibly moving said first and second shell portions between a closed position engaging said rig piling and an open position disengaging said rig piling;

c. means contained on the inner wall of each of said shell portions for frictionally engaging the wall of said piling, and allowing controlled movement of said piling when said shell portion are forcibly moved into substantially closed positions.

4,509,884

INJECTION NOZZLE FOR ADHESIVE MATERIALS

John F. Trout, West Chicago, Ill., and John J. Hoffman, South Bend, Ind., assignors to Lily Corporation, Chicago, Ill.

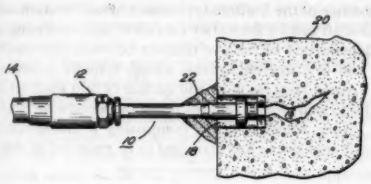
Filed May 2, 1983, Ser. No. 490,459

Int. Cl.³ B65B *3/04*; B29F *1/00*; E02D *5/18*; E04G *23/02*

U.S. Cl. 405—269 **5 Claims**

1. A nozzle for injecting an adhesive material into fissures and other voids intersecting a drilled hole in concrete and other building structures, comprising an elongated body portion having proximal and distal ends, said body portion having a hollow center channel connected to and communicating with said distal end for the flow of adhesive material into the drilled hole, a plurality of substantially rigid lugs extending radially outwardly on the distal end of said body portion for contacting the sides of the drilled hole, said lugs being spaced from one another to form a plurality of spaced slots for the flow of adhesive material therethrough, a plurality of spaced grooves disposed in said distal end around said channel and extending radially from said channel to said slots for evenly distributing

the adhesive material, and substantially rigid collar disposed around said body portion in spaced relation to said distal end



and said lugs for forming a seal with the side walls of the drilled hole.

4,509,885

SKIVING AND ROLLER BURNISHING TOOL

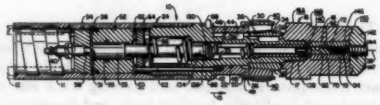
Lawrence C. Dickinson, 2255 Eva Adams, Reno, Nev. 89504

Continuation-in-part of Ser. No. 301,503, Sep. 14, 1981, Pat. No. 4,425,693, Ser. No. 205,026, Nov. 7, 1980, Pat. No. 4,380,851, and Ser. No. 183,664, Sep. 2, 1980, Pat. No. 4,367,576. This application Jul. 26, 1982, Ser. No. 401,580

The portion of the term of this patent subsequent to Jan. 11, 2000, has been disclaimed.

Int. Cl.³ B24B *39/00, 39/02*

U.S. Cl. 407—1 **15 Claims**



1. A skiving and roller burnishing tool comprising:

an elongate drive tube having a central axis defining a forward and a rearward direction;

a retractable knife mounted at the forward end of the drive tube, said knife including a knife blade radially movable with respect to the axis of the drive tube, a push dart movable path along an axial path, and means for coupling the push dart to the blade so that the blade is retracted when the push dart is in a first axial position and extended when the blade is in a second axial position;

a roller race mounted coaxially on the drive tube to the rear of the retractable knife and having a frustoconical outer surface tapering radially outward in the axially forward direction;

a plurality of frustoconical tapered rollers each having a large end and a small end and being arranged about said outer surface with the small ends of the rollers facing forward so that the surface portion of each roller furthest from the roller race is generally parallel to said central axis and the rollers may be extended radially outward by moving forward along the roller race;

a roller cage having a plurality of slots, said roller cage circumscribing and being spaced apart from the roller race so that said slots and said roller race together define a plurality of cavities for receiving individual rollers; and

means for selectively biasing both the push dart and the rollers in (1) the forward direction so that the blade and the rollers may be simultaneously extended and (2) means for biasing both the push dart and the rollers in the rearward direction so that the blade and the rollers may be simultaneously retracted, said means for selectively biasing including a pair of concentric pistons mounted to reciprocate axially in the drive tube, one of the pistons being coupled to the push dart and the other being coupled to the rollers, and means for applying a preselected fluid pressure to both pistons simultaneously to bias said pistons in opposition to said rearward biasing means whereby the blade and the rollers may be simultaneously extended.

4,509,886

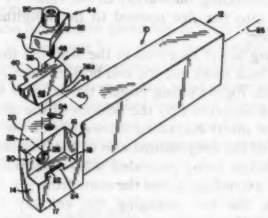
CUTTING TOOL WITH CUTTING INSERTS HAVING POSITIONING KEYWAYS

Harold W. Lindsay, 2451 NW. 30th, Portland, Oreg. 97210

Filed Nov. 25, 1983, Ser. No. 555,016

Int. Cl.³ B23P *15/28;* **B26D** *1/00, 3/00*

U.S. Cl. 407—102 **6 Claims**



1. A cutting tool comprising:

a holder having a longitudinal mounting axis and a plurality of sides generally parallel thereto, the holder having a transverse axis perpendicular to the longitudinal axis, the holder having an end face generally parallel to the transverse axis, the end face being adapted to be placed adjacent a workpiece;

a cutting insert receiving slot extending inwardly of the holder from the end face generally in the direction of the longitudinal axis of the holder, the slot being adjacent one of the sides of the holder, the slot defining an end face and a bottom and a pair of walls within the holder, one of the pair of walls being adjacent the one side of the holder and flush therewith, the wall adjacent the one side of the holder being cut parallel to the bottom of the slot to form a retaining lip extending normal to the bottom and flush with the one side of the holder, the retaining lip being cut to a length less than the length of the slot, the retaining lip being disposed between the end face of the holder and the end face of the slot;

a cutting insert received in the slot, the insert having front and back faces and top and bottom sides and opposite ends which form cutting edges, the bottom side of the insert being supported by the bottom of the slot, a cutting edge of the insert extending outwardly of the slot in the direction of the longitudinal axis of the holder, the front face of the insert being provided with a centrally disposed keyway extending across the same from the top to the bottom sides, the keyway having a dimension in the direction of the longitudinal axis of the holder equal to the length of the lip, the keyway having a dimension in the direction of the transverse axis of the holder equal to the dimension of the lip in the direction of the transverse axis of the holder, the lip engaging the keyway longitudinally to locate the insert relative to the holder and to prevent movement thereof in the direction of the longitudinal axis of the holder, the lip preventing movement of the insert normal to its face; and

clamping means engaging the top side of the insert to clamp the insert into the slot and into engagement with the lip.

4. A cutting tool comprising:

a holder having a longitudinal mounting axis and a plurality of sides generally parallel thereto, the holder having a transverse axis perpendicular to the longitudinal axis, the holder having an end face generally parallel to the transverse axis, the end face being adapted to be placed adjacent a workpiece;

a cutting insert receiving slot extending inwardly of the holder from the end face generally in the direction of the longitudinal axis of the holder, the slot being adjacent one of the sides of the holder, the slot defining an end face and a bottom and a pair of walls within the holder, one of the pair of walls being adjacent the one side of the holder and flush therewith, the wall adjacent the one side of the holder being cut parallel to the bottom of the slot to form a retaining lip extending normal to the bottom and flush with the one side of the holder, the retaining lip being cut to a length less than the length of the slot, the retaining lip being disposed between the end face of the holder and the end face of the slot;

a key extending outwardly of the other of the pair of walls and into the slot normal to the longitudinal axis of the holder;

a cutting insert received in the slot, the insert having front and back faces and top and bottom sides and opposite ends which form cutting edges, the bottom side of the insert being supported by the bottom of the slot, a cutting edge of the insert extending outwardly of the slot in the direction of the longitudinal axis of the holder, the back face of the insert being provided with a centrally disposed keyway extending across the same from the top to the bottom sides, the key engaging the keyway longitudinally to locate the insert relative to the holder and to prevent movement thereof in the direction of the longitudinal axis of the holder, the lip preventing movement of the insert normal to its face; and

clamping means engaging the top side of the insert to clamp the insert into the slot and into engagement with the lip.

4,509,887

MEANS FOR CONNECTING A MALE PART TO A FEMALE PART

Mats E. Hofling, Sandviken, Sweden, assignor to Santrade Ltd., Lucerne, Switzerland

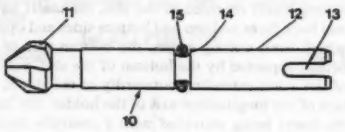
PCT No. PCT/SE81/00330, § 371 Date Jul. 12, 1982, § 102(e) Date Jul. 12, 1982, PCT Pub. No. WO82/01679, PCT Pub. Date May 27, 1982

PCT Filed Nov. 10, 1981, Ser. No. 403,520

Claims priority, application Sweden, Nov. 13, 1980, 8007963

Int. Cl.³ B23B *31/08*

U.S. Cl. 408—239 R **3 Claims**



1. The combination of a tool and a rotary tool holder for receiving said tool to rotate same, one of said tool and holder comprising a sleeve and the other a shaft, said shaft being insertable into said sleeve to an operating position, said shaft and said sleeve including first and second torque transfer means, respectively, which are interengageable for establishing a torque transmitting relationship between said sleeve and said shaft in response to insertion of said shaft into said sleeve with said torque transfer means properly aligned for interengagement, said first and second torque transfer means being mutually alignable in response to relative rotation between said shaft and sleeve and being interengageable into torque-transmitting relationship in response to relative axial, non-rotational movement between said shaft and sleeve, and friction means carried by one of said shaft and sleeve and being frictionally engageable with the other when said shaft is in said operating position so as to frictionally resist mutual separation of said shaft and sleeve, the location of said friction means relative to said first and second torque transfer means being such that said first and second torque transfer means interengage before said friction means engages said other of said shaft and sleeve, whereby said shaft and sleeve can be relatively rotated into proper alignment in the absence of the frictional resistance of said friction means, and said shaft can be thereafter moved to said operating position independently of relative rotation between said shaft and sleeve, said first interengageable torque transfer means comprising a diametrical slit in an end surface of said shaft which is inserted into said sleeve, said slit being open endwise, and said second torque transfer means comprising a diametrical pin disposed in said sleeve and arranged to be received in said slit.

4,509,888

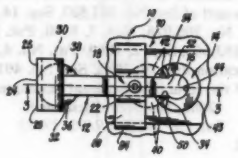
TRACK FASTENER

Roy S. Sheek, Yadkinville, N.C., assignor to Fairchild Industries, Inc., Germantown, Md.

Filed Aug. 4, 1982, Ser. No. 405,043

Int. Cl.³ B60P *7/00*; B61D *45/00*; B64D *9/00*

U.S. Cl. 410—105 **9 Claims**



1. Track fastener apparatus for use with a locking track having an upper surface and sides comprising a track fastener body, means associated with said track fastener body for securing said track fastener body to said locking track and means associated with said track fastener body and having portions thereof locatable around at least portions of the sides of said locking track for reinforcing a portion of said locking track for preventing the side portions from bulging outward when forces are applied to said track fastener body.

4,509,889

METHOD OF ROCK BOLTING AND TUBE-FORMED EXPANSION BOLT

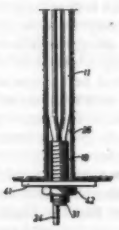
Bo T. Skogberg, Handen, and Gunnar V. R. Romell, Djursholm, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Division of Ser. No. 127,776, Mar. 6, 1980,. This application Jan. 23, 1984, Ser. No. 572,830

Claims priority, application Sweden, Mar. 9, 1979, 7902129

Int. Cl.³ E21D *21/00*

U.S. Cl. 411—19 **13 Claims**



1. A tube-formed elongated expansion bolt, comprising:

an expansible elongated tube having a deep continuous longitudinal depression which extends inwardly of the bolt toward the axis of the bolt, the tube having a major closed

cross-sectional portion in the area of the deep longitudinal depression, and the tube being closed at one end thereof which is the bottom end thereof;

said tube having a longitudinal portion in the area of the longitudinal depression which has a peripheral length in a cross-section which exceeds the periphery of a circle having a diameter equal to the largest transverse dimension of the bolt in the cross-section of the bolt;

said longitudinal portion being expandable to increase said largest transverse dimension of said bolt under the temporary application of high-pressure fluid to the interior of said tube without stretching the material of said tube; and

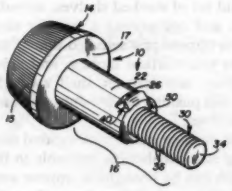
coupling means at the end portion of said bolt opposite said bottom end for applying high-pressure fluid to the interior of said tube to expand said tube against a borehole so as to cause permanent gripping action of the tube against the inner surface of the bore hole without stretching the material of the tube, the pressure being released after expansion of said bolt.

4,509,890

CAPTIVE PANEL SCREW

Royce W. Hill, Flippin, Ark., assignor to Micro Plastics Inc., Flippin, Ark.

Filed Oct. 13, 1981, Ser. No. 310,376
Int. Cl.³ F16B *39/00*
U.S. Cl. 411—337 **1 Claim**



1. A one-piece, plastic captive panel screw adapted to be fitted through a suitable first orifice in a first workpiece, said captive panel screw comprising:

a head having a diameter substantially greater than the diameter of said first orifice and a face adapted to contact said first workpiece when said screw is properly installed;

means for subsequently penetrating and snap fitting within a suitable second orifice aligned with said first orifice, said second orifice defined in a second workpiece, whereby to maintain said first and second workpieces in generally parallel, spaced-apart relation, said last mentioned means comprising an integral, elongated shaft assembly projecting axially outwardly from the center of said head, said shaft assembly comprising:

a spacer section having a diameter less than the diameter of said head, said spacer section extending a predetermined length from said head and terminating in a shoulder portion spaced-apart from said head, said shoulder portion adapted to contact said second workpiece when said screw is properly installed;

a relief section formed in said spacer section and adjoining said spacer shoulder portion, said relief section having two opposed, parallel flat sides and two arcuate sides and having a minor dimension less than the diameter of said spacer section diameter and a major dimension equal to the diameter of said spacer section diameter, and said relief section having a length substantially less than said length of said spacer section;

a terminal threaded section adapted to penetrate said second orifice and having a diameter smaller than said spacer section diameter and smaller than said minor dimension of said relief section, said threaded section having a length substantially greater than said length of said relief section, the threaded section being adapted to receive a suitable nut whereby to secure a third workpiece; and,

a flange section dividing said terminal threaded section from said relief section, said flange section having an outer effective diameter greater than the diameter of said spacer section but smaller than the diameter of said head, the flange section being of generally frusto-conical dimensions and comprising a pair of symmetrical wedges extending perpendicularly outwardly from the axis of the screw and separated from each other by equal radially spaced-apart intervals, the angularly inclined outer faces of said wedges tapering toward said threaded section in a reduced diameter portion of said flange section; and,

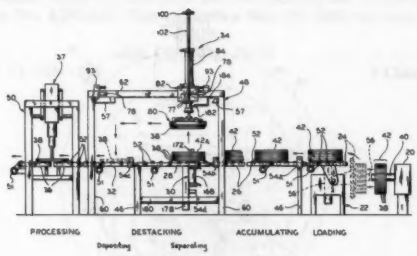
said flange section adapted to yieldably deform toward said relief section in response to forcible penetration of said second workpiece orifice by said shaft, said shaft operable to anchor said screw relative to said workpieces with said second workpiece maintained between said flange section and said shoulder portion of said spacer section, said relief section substantially captivated within said second orifice within said second workpiece.

4,509,891

METHOD AND APPARATUS FOR SUPPLYING METAL COILS TO A PROCESSING STATION

Robert J. Lipscomb, West Chicago, Ill., assignor to Precision Steel Warehouse, Inc., Franklin Park, Ill.

Filed Jun. 22, 1979, Ser. No. 51,217
Int. Cl.³ B65G *59/04*
U.S. Cl. 414—113 **11 Claims**



1. A method for supplying individually to a processing station annular metal coils which are provided in groups of adjacent side-by-side coils, which comprises the steps of:

providing a horizontal conveyor line including successive power-driven accumulating, separating, and depositing conveyor sections leading forwardly from a loading station towards a processing station, each of said conveyor sections being drivable independently of the others,

placing said groups of coils in following order on said conveyor line at said loading station with the coils thereof stacked vertically,

driving said accumulating and separating sections to convey said groups of coils forwardly to the separating section in turn,

providing a lifting head operatable to engage the top coil of a group of coils on said separating section for the purpose of lifting the coil off of the remainder of the group, and to deposit the coil therefrom,

inserting a stop member into each of said groups of coils on said separating section through the openings in the coils and into abutting engagement with the rear portions of the inner wall surfaces of the cells, while driving the separating section, thereby to orient the group beneath said lifting head for said engagement thereof with the top coil,

destacking each of said groups of coils in turn while the group is stationary on said separating section by operating

said lifting head to lift from the top of the group, carry forwardly, and deposit on said depositing section individual coils of the group successively,

driving said depositing section to convey each deposited coil forwardly out of its deposited position before depositing the next coil therein, and

driving said accumulating section while a group of coils is stationary on said separating section for destacking thereof, to accumulate following groups of coils on the accumulating section.

4,509,892

APPARATUS FOR MANIPULATING WORKPIECES HAVING PLANE PARALLEL SURFACES

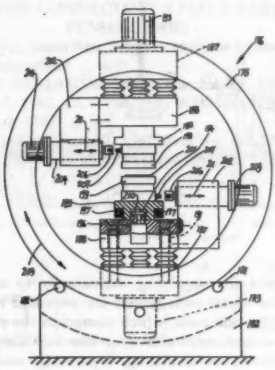
Werner Redeker, Börnsen, and Uwe Uhlig, Buchholz, both of Fed. Rep. of Germany, assignors to Hauni-Werke Körber & Co. KG, Hamburg, Fed. Rep. of Germany

Division of Ser. No. 328,861, Dec. 9, 1981, Pat. No. 4,453,347. This application Feb. 14, 1984, Ser. No. 580,095

Claims priority, application Fed. Rep. of Germany, Dec. 13, 1980, 3047035

Int. Cl.³ B23Q 7/14

U.S. Cl. 414—223 5 Claims



1. Apparatus for supporting, locating and transferring workpieces, particularly workpieces having pairs of plane parallel surfaces, for removal of material at a succession of stations, comprising work holder means including at least two spaced-apart work carriers having fully overlapping parallel surfaces which face each other, each of said carriers being activatable to attract workpieces to its surface and deactivatable to release such workpieces so that a workpiece between the surfaces of the carriers can be transferred from one of said carriers to the other of said carriers by deactivating the one carrier while the other carrier is activated; means for moving said carriers relative to each other in directions to increase or reduce the distance between the surfaces of such carriers; a self-sustaining frame for said carriers; a pallet for each of said carriers; means for delivering pallets with carriers to said frame; means for removing pallets with carriers from said frame; and means for turning said frame about a predetermined axis to thereby reverse the positions of said carriers, said axis being parallel to the surfaces of said carriers.

4,509,893

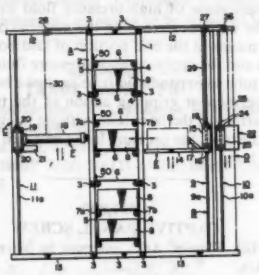
DEVICE FOR STORING AND RETRIEVING ARTICLES IN A SHELF STACK

Junichi Nashimoto, Yokosuka, and Zenkichi Kurokawa, Yokohama, both of Japan, assignors to Okamura Corporation, Japan

Filed Jan. 14, 1983, Ser. No. 457,958

Int. Cl.³ B65G 1/00

U.S. Cl. 414—280 2 Claims



1. An article storing and retrieving device, for use with a stacked set of a plurality of shelves, comprising:

(a) an article handling and pushing device, located on one side of said set of stacked shelves, movable in the vertical direction, and comprising a transfer shelf which can be brought to oppose any selected one of said stacked set of shelves by said vertical motion, and a means for moving articles from said transfer shelf away from said article handling and pushing device onto said opposed one of said stacked shelves;

(b) an article pushing out device located on the other side of said set of stacked shelves, movable in the vertical direction, which can be brought to oppose any selected one of said stacked set of shelves by said vertical motion, and comprising a means for pushing articles off from said selected one of said stacked shelves away from itself; and

(c) a raising device, which moves both said article handling and pushing device and said article pushing out device in the vertical direction, and which keeps both said article handling and pushing device and said article pushing out device at substantially the same height at all times.

4,509,894

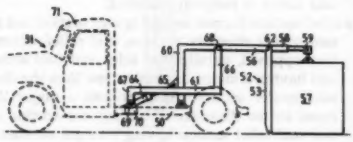
LOADING AND UNLOADING APPARATUS FOR A VEHICLE

Keith O. Rolfe, 564 Zillmere Rd., Zillmere, Queensland, Australia 4034

Continuation-in-part of Ser. No. 169,028, Jul. 15, 1980, Pat. No. 4,355,942. This application May 13, 1982, Ser. No. 377,869 The portion of the term of this patent subsequent to Oct. 26, 1999, has been disclaimed.

Int. Cl.³ B60P 1/00

U.S. Cl. 414—555 6 Claims



1. Loading and unloading apparatus for a vehicle, comprising:

(a) a lift assembly including a frame releasably connected to a load, said frame including a substantially vertical back frame having a pair of parallel side members intercon-

nected by a transverse top member, said back frame being adapted to engage a forward end of said load, and a pair of parallel arms rigidly attached to said top member and extending forwardly thereof relative to said vehicle;

(b) parallel motion links connecting said frame to said vehicle, said links comprising a pair of L-shaped lifting links each having one end pivotally connected to said frame and the other end pivotally connected to the vehicle, and a pair of stabilizing links each having an upper arm with two ends, one end of said upper arm being pivotally connected to one of the parallel arms of the frame, and a bottom arm extending substantially perpendicularly from said upper amr, said bottom arm having two ends, one of said bottom arm ends being fixedly connected to the other of said upper arm ends, and the other of said bottom arm ends being pivotally connected to said vehicle; and

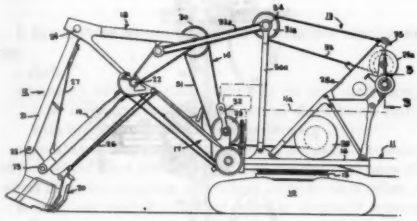
(c) means for moving said lifting and stabilizing links in parallelism to move the back frame to either a carrying or loaded position supported on the vehicle, or to a loading or unloading position at or near ground level behind the vehicle.

4,509,895

CROWD DRIVE ASSEMBLY FOR POWER SHOVELS

George B. Baron, Marion, Ohio, assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Oct. 6, 1978, Ser. No. 950,003
Int. Cl.³ E02F *3/62*
U.S. Cl. 414—685 **22 Claims**



1. In a power shovel having a main support unit, a front end assembly operatively connected to said main support unit and a rope crowd system mounted on said main support unit and operatively connected to said front end assembly, a crowd drive assembly for said rope crowd system comprising a rope drum mounted on a support frame supported on said main support unit, a pinion drive shaft journaled in said support frame adjacent the tangential point of said crowd rope wound on said drum, transversely spaced means disposed on said pinion drive shaft for simultaneously transmitting torque to said rope drum and means supported on said main support unit for driving said pinion drive shaft.

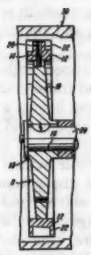
4,509,896

TURBINE ROTOR

Eugene Linsker, Dayton, Ohio, assignor to Tech Development Inc., Dayton, Ohio

Filed Mar. 1, 1982, Ser. No. 353,615
Int. Cl.³ F01D *21/02*
U.S. Cl. 415—9 **7 Claims**

1. A rotor for placement within a substantially peripherally encompassing shield or protective wall structure, said rotor comprising a ring-shaped radially outermost part, a part radially inward thereof adapted for connection with a shaft, bearing means coupling said parts, said bearing means being constructed and arranged to provide means through which said ring-shaped part has a driving relation to said part radially inward thereof, said radially outermost part being mounted to normally move radially with respect to said radially inward part, in a direction and to a degree corresponding, substantially, to the speed of its rotation while maintaining, normally, when energized, a driving relation to said radially inward part, said radially outermost part being constructed and arranged for a deliberate radial fracture, a predictable expansion and displacement thereof relative said bearing means and an expanding substantial engagement of its outermost surface with the shield or protective wall structure within which it is placed upon the rotor reaching a predetermined level of the speed of its rotation beyond which a self destruction and fragmentation of the rotor or a part thereof might otherwise result.

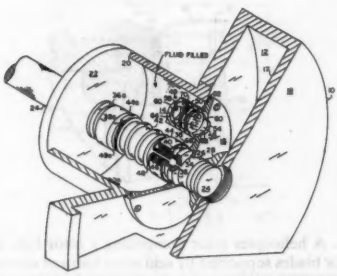


4,509,897

ROTARY PUMP ASSEMBLY CONTAINER

James O. Sims, Rte. 2, Box 246, Hartselle, Ala. 35640

Continuation-in-part of Ser. No. 302,643, Sep. 15, 1981, Pat. No. 4,384,820, which is a division of Ser. No. 945,558, Sep. 25, 1978, Pat. No. 4,289,445. This application May 23, 1983, Ser. No. 496,881
Int. Cl.³ F04D *29/10*
U.S. Cl. 415—113 **1 Claim**



1. A rotary pump assembly comprising:

a generally circular pump enclosure;

a seal enclosure sharing a common wall with said pump enclosure, and said seal enclosure having a wall opposite to that of said common wall;

a lubricating fluid within said seal enclosure;

a rotary pump positioned within said pump enclosure and having a driven shaft which passes through said walls;

first and second stationary shaft sealing members positioned around said shaft in opposite walls of said seal enclosure, and said sealing members having facing planar seal surfaces;

first and second spaced rotating seal members around and rotating with said shaft, said first rotating seal member having a planar surface positioned adjacent to and adapted to frictionally engage said first stationary seal member, and said second rotating seal member having a planar surface adjacent to and adapted to frictionally engage

with the planar surface of said second stationary seal member;

spring bias means for applying a bias to said rotating sealing members for biasing and rotating sealing members against said stationary sealing members;

an opening in said common wall from said seal enclosure to said pump enclosure and intercepting a radial position in said pump enclosure which is intermediately between a said shaft opening and the circumference of said pump enclosure;

a piston casing positioned within said seal enclosure and projecting from and transverse with respect to said common wall, said casing having a first end region secured to said common wall around said opening, and a second end region opening into said seal enclosure; and

a piston axially movable within said casing adjacent said common wall, said piston being movable intermediately between said first and second end regions and sealably interrupting a passageway between said seal enclosure and said pump enclosure, whereby the fluid pressure in said pump enclosure adjacent to said opening, being a pressure in a basically intermediate radial region of said pump enclosure, is directly transmitted through said opening to said piston to said lubricating fluid in said seal enclosure, and then, as an additional bias, to said rotating seal members.

4,509,898

HELICOPTER ROTORS

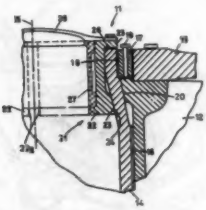
Alan Gormer, Yeovil, England, assignor to Westland plc, Yeovil, England

Filed Jun. 20, 1983, Ser. No. 505,860

Claims priority, application United Kingdom, Jul. 2, 1982, 8219139

Int. Cl.³ B64C *11/02*

U.S. Cl. 416—2 **5 Claims**



1. A helicopter rotor comprising a rotor hub, a plurality of rotor blades supported by said rotor hub and extending radially therefrom, a tubular rotor drive shaft disposed within said rotor hub, primary attachment means operatively interconnecting said hub and tubular rotor drive shaft to provide a primary thrust load path, and secondary attachment means disposed internally of said drive shaft comprising a multi-part collect including a plurality of identical collect parts for retaining the rotor hub in the event of failure of the primary thrust load path.

4,509,899

TRAVERSING BLADE-ROTARY PROPELLER

Larry J. Frederick, P.O. Box 794 SLU, Hammond, La. 70402

Filed Mar. 28, 1983, Ser. No. 460,032

Int. Cl.³ B64C *11/46*

U.S. Cl. 416—99 **13 Claims**

1. A traversing blade rotary propeller useful for the application of laterally acting forces upon a fluid medium to produce propulsion as by attachment via a mount to a craft for propulsion of the craft, which comprises:

a stationary main shaft, one end of which is suitable for attachment to the mount, the other of which is provided with gear means,

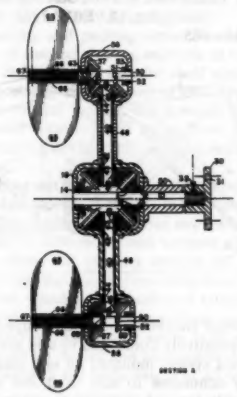
a housing, inclusive of

a central gear means housing into which the gear means end of said stationary main shaft is extended and supported, rotatably mounted upon said stationary main shaft, and

peripheral gear means housings alternately disposed and adjoined to said central gear means housing,

a pair of radial arm shafts each end of which carries gear means, alternately disposed, radially mounted, each extended from said central gear means housing to said peripheral gear means housings, a gear means end of each radial arm shaft extending into said central gear means housing to operatively engage the gear means end of said stationary main shaft such that relative movement between the engaged gear means ends of the radial arm shafts and the stationary main shaft will cause the radial arm shafts to rotate about their own axes one relative to the other in equal and opposite directions, the opposite end gear means of a radial arm shaft extending into the peripheral gear means housings,

a pair of propeller blade shafts each mounted perpendicular to a radial arm shaft, each being equally and oppositely deflected at an angle such that the axes thereof are non-



parallel with the axis of the stationary main shaft, and define equal and opposite angles relative to a line parallel with the axes of the radial arm shafts which perpendicularly intersects the stationary main shaft, one each of which carries an affixed gear means, the gear means end of each propeller blade shaft extending into the peripheral gear means housings such that a gear means thereof is operatively engaged with a gear means of each of said radial arm shafts,

a pair of flat propeller blades, one each of which is mounted upon an end of each of said propeller blade shafts, similarly directionally oriented one with respect to the other, and

a power means for applying force to rotate the central gear means housing relative to the stationary main shaft whereby the radial arm shafts are rotated to drive the propeller blade shafts in a direction opposite to that in which the central gear housing is rotated and to the same degree, the propeller blades one relative to the other in turn being maintained in fixed orientation as the central gear means housing is rotated relative to the stationary main shaft, while the flat propeller blades as they are moved along a continuous circular path around the axis of the stationary main shaft are oscillated in equal and opposite directions across the swath defined by the circle, each

like the caudal fin of a fish or the fluke of a whale in propulsion.

4,509,900

TURBINE ROTOR

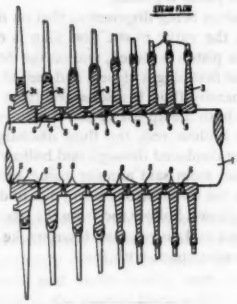
Masachika Odawara, Yokohama, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Oct. 14, 1983, Ser. No. 542,216

Claims priority, application Japan, Oct. 14, 1982, 57-180376; Jan. 25, 1983, 58-11119

Int. Cl.³ F01D 5/06

U.S. Cl. 416—198 A 5 Claims



1. In a turbine having a fluid flow, a turbine rotor comprising:

a shaft;

a plurality of wheel discs shrunk-fit on said shaft along the axial direction thereof, said wheel discs being provided with blades on the outer circumference thereof;

a plurality of first coupling members disposed between each of first wheel discs defined by at least the upsteam ones of said wheel discs for coupling said wheel discs to each other, and

at least one second coupling member disposed between at least one second wheel disc disposed at the downstream end of said shaft and said shaft.

4,509,901

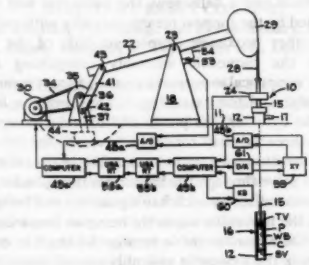
METHOD AND APPARATUS FOR DETECTING PROBLEMS IN SUCKER-ROD WELL PUMPS

Louis S. McTamaney, Cupertino; Allan B. Delfino, Sunnyvale, both of Calif., and Gary W. Bisbee, The Woodlands, Tex., assignors to FMC Corporation, Chicago, Ill.

Filed Apr. 18, 1983, Ser. No. 470,021

Int. Cl.³ F04B 49/06; E21B 47/00; G06F 15/20

U.S. Cl. 417—18 14 Claims



1. Apparatus for automatically detecting and classifying pump problems in a well pumping unit having a deep well pump connected to a sucker-rod string and a power unit to reciprocate said rod string to produce fluid from an underground location, said apparatus comprising:

first transducer means for generating a signal representative of a load on said rod string;

second transducer means for generating a signal representative of a position of said rod string;

means for using said load signals and said position signals to obtain a plurality of characteristic values from a calibration dynagraph with said pumping unit operating in an acceptable mode during a calibration period;

means for storing said characteristic values from said calibration dynagraph;

means for processing said load signals and said position signals to obtain a well dynagraph as said power unit operates to produce fluid from said underground location; and

means for comparing a plurality of predetermined characteristic values of said well dynagraph with corresponding characteristic values of said calibration dynagraph to detect and classify said pump problems.

4,509,902

POWER REGULATING DEVICE FOR A HYDROSTATIC PUMP

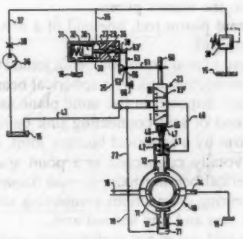
Emil Knodel, Stuttgart, and Gerhard Nonnenmacher, Korntal, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Apr. 4, 1983, Ser. No. 481,264

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213377

Int. Cl.³ F04B 49/00

U.S. Cl. 417—216 5 Claims



1. A power regulating device for a hydrostatic pump with a stroke-varying member, comprising

a pressure medium source;

at least one pressure-loaded piston adjusting the stroke-varying member against a counterforce and being pressure loaded by said pressure medium source;

a valve controlling said adjusting piston and having two sides;

two springs acting upon said valve at its one side;

a gauge piston loaded by a delivery pressure in a predetermined direction and a lever applying a force proportional to the delivery pressure to said valve at its other side via said gauge piston and said lever;

an intermediate member;

an additional spring acting upon said gauge piston via said intermediate member in the same direction in which the delivery pressure acts upon said gauge piston; and

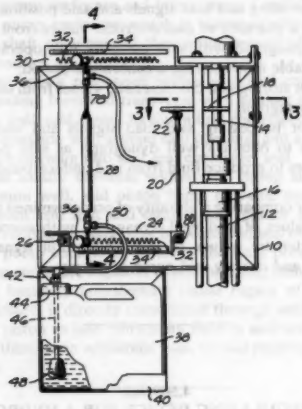
a second pressure medium source acting with a variable control pressure upon said intermediate member against said additional spring.

4,509,903

CATALYST SLAVE PUMP

Jerry R. Fram, 10627 Rochester Ave., Los Angeles, Calif. 90024

Filed Oct. 18, 1983, Ser. No. 543,089
Int. Cl.[3] F04B *19/02, 23/04;* F15B *15/24;* B67D *5/52*
U.S. Cl. 417—464 7 Claims



1. The combination comprising:
a supporting frame,
a master reciprocating pump for pumping a first liquid and fixed to said frame, said master pump having a cylinder and a piston and rod reciprocating within said cylinder,
a reciprocating slave pump for pumping a second liquid,
a first arm affixed to said frame, said first arm holding one end of said slave pump in a fixed pivoting position with respect to the master pump,
affixed to said piston rod, one end of a drive link,
a connecting link,
the other end of said drive link being joined to the upper end of said connecting link by a spherical bearing connection,
a second arm disposed in the same plane as said first arm,
the lower end of said connecting link being joined to said second arm by a spherical bearing joint, said second arm being pivotally connected at a point spaced apart from said spherical bearing joint, to said frame,
spherical bearing connections connecting said slave pump to said first arm and said second arm,
whereby as said piston rod reciprocates, said connecting link moves generally parallel to said piston rod and said second arm is moved by said connecting link in an arc about the end pivotally connecting to the frame and said slave pump is caused to reciprocate by the relative movement of said second arm with respect to said first arm.

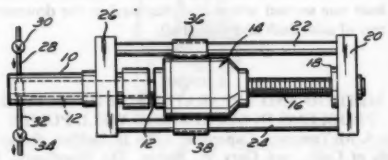
5. A reciprocating pump having:
a cylinder,
a piston within said cylinder,
a hollow rod connected to said piston, said piston and hollow rod being reciprocable within said cylinder, an opening in the face of said piston and a check valve for regulating fluid flow through said piston and into said hollow rod,
a first fixed plug forming one end of said cylinder, a check valve in the face of said plug for regulating flow through said plug, and a fluid inlet passage communicating with the valve in the plug for introducing liquid into said cylinder,
a second fixed plug at the opposite end of said cylinder, said hollow rod passing slidably therethrough,
a fluid discharge passage for said pump being in fluid communication with the interior of said hollow rod,
an annular fluid space within said cylinder between said piston and said second plug, said annular space surrounding the exterior of said rod,
the interior of said hollow rod communicating with both said discharge passage for said pump and said annular space,
an outer tube around the exterior of said cylinder, said outer tube being out of contact with said fluid passages and spaces, said first fixed plug and said second fixed plug being snuggly received in the opposite ends of said outer tube to seal said outer tube.
complementary interacting retaining means on said outer tube, said first fixed plug, and said second fixed plug for holding the pump together,
said check valves being disposed so that on the up stroke of the piston, the valve in the first plug is open while the valve in the piston is closed, and on the down stroke, the valve in said first plug is closed, and the valve in the piston is open whereby fluid is discharged from said discharge passage on both the up stroke and the down stroke of said piston and hollow rod, the fluid discharged on the up stroke being displaced through said hollow rod due to the flow of fluid from said annular space and the fluid discharged on the down stroke being due to displacement of fluid through said hollow rod from the space between said first plug and said piston, said down stroke also replenishing said annular space with fluid.

4,509,904

METERING PUMP

Christopher R. MacAskill, Sunnyvale, and Jared M. Potter, Mountain View, both of Calif., assignors to Petrophysical Services, Inc., Mountain View, Calif.

Filed Oct. 4, 1983, Ser. No. 538,774
Int. Cl.[3] F04B *21/02, 39/10*
U.S. Cl. 417—568 2 Claims



1. A coaxially aligned pumping machine comprising the combination of a fixed assembly and a moveable assembly; the fixed assembly comprising in combination at least one support means, a pump cylinder having means to permit inflow and outflow of fluid and a ballscrew, the ballscrew and cylinder being mounted by the support means coaxially with and spaced from each other proximate respective ends of the support means; and the moveable assembly comprising a drive mounted for reciprocal movement on the support means of the fixed assembly, a piston extending in one direction from the drive into the cylinder, the piston and cylinder comprising a pump, and a threaded shaft rotatably driven by the drive selective in two directions of rotation extending in the other direction from the drive through the ballscrew, the cylinder, piston, drive, shaft and ballscrew each having an axis and being coaxially aligned, the moveable assembly being so constructed and configured that when the drive rotates the shaft in one rotational direction, the moveable assembly moves in one reciprocal direction, and when the drive rotates the shaft in the other rotational direction, the moveable assembly moves in the other reciprocal direction to thereby cause the piston to reciprocate in the cylinder to pump fluid into and out of the cylinder.

4,509,905

COMPRESSOR WITH EXTENDED AREA BETWEEN SUCTION PORT AND SUCTION GROOVE

Teruo Maruyama, Hirakata, and Shinya Yamauchi, Katano, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

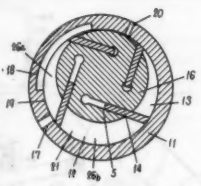
PCT No. PCT/JP82/00420, § 371 Date Jun. 27, 1983, § 102(e) Date Jun. 27, 1983, PCT Pub. No. WO83/01659, PCT Pub. Date May 11, 1983

PCT Filed Oct. 27, 1982, Ser. No. 516,606

Claims priority, application Japan, Oct. 28, 1981, 56-173497

Int. Cl.³ F04C *18/00*

U.S. Cl. 418—75 5 Claims



1. In a rotary compressor of the type including a cylinder, a rotor mounted eccentrically within the interior of said cylinder for rotation, a plurality of vanes mounted on said rotor for rotation therewith, said vanes having ends contacting said cylinder and dividing the interior thereof into vane chambers which progressively increase and then decrease in volume during rotation, and side plates fixed to opposite sides of said cylinder and closing the interior thereof, the improvement comprising:

suction port means for introducing refrigerant into a first said vane chamber during a suction stroke of said first vane chamber;

suction groove means for permitting refrigerant from said suction port means to pass from said first vane chamber to a second said vane chamber located immediately upstream of said first vane chamber with respect to the direction of rotation of said rotor during a first portion of said suction stroke of said first vane chamber; and

means positioned to be contacted by the said vane between said first and second vane chambers during a second portion of said suction stroke of said first vane chamber just prior to completion thereof, and thereby for restricting the passage of said refrigerant from said first vane chamber to said second vane chamber.

4,509,906

VANE TYPE ROTARY COMPRESSOR HAVING A WEAR RESISTANT RESIN COATING

Toshihiko Hattori; Yuji Akagi, and Hideo Kohara, all of Hiroshima, Japan, assignors to Toyo Kogo Co., Ltd., Hiroshima, Japan

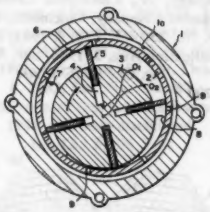
Filed Mar. 30, 1984, Ser. No. 595,495

Claims priority, application Japan, Mar. 31, 1983, 58-56309

Int. Cl.³ F04C *29/00*

U.S. Cl. 418—152 5 Claims

1. A rotary compressor comprising a housing having a cylindrical inner wall surface, a rotatable sleeve having an inner and outer surfaces and disposed in the housing for rotation about a first longitudinal axis, a rotor disposed in said sleeve for rotation about a second longitudinal axis which is offset from the first longitudinal axis, a plurality of vanes carried by said rotor to extend substantially in radial directions and having radially outer edges maintained in contact with the inner surface of the sleeve so that the sleeve is rotated as the rotor and the vanes rotate, at least one of the inner wall surface of the housing and the outer surface of the sleeve having a coating comprised of a wear-resistant resin dispersed with 10 to 120 volume part of a



solid lubricant and 5 to 50 volume part of metal flakes for 100 volume part of the resin.

4,509,907

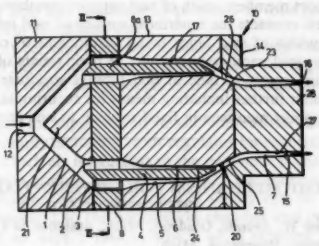
EXTRUSION HEAD FOR TUBULAR BODIES AND HOLLOW PROFILES

Heinz Ratheiser, Vienna, Austria, assignor to American Maplan Corporation, McPherson, Kans.

Filed May 13, 1983, Ser. No. 494,248

Int. Cl.³ B29F *3/04*

U.S. Cl. 425—197 9 Claims



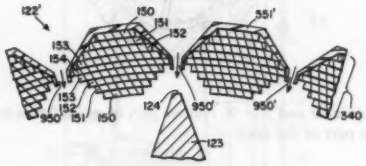
1. An extrusion head for the production of a hollow profile of a thermoplastic material comprising:

a housing formed with an inner mandrel and a hollow mandrel coaxial with said inner mandrel and defining in said housing a flow channel for said material which is annular over its entire length, said flow channel having an annular inlet at one axial end of said housing, an annular divergent portion downstream of said inlet for distributing said material outwardly, a pair of coaxial annular portions communicating with said divergent portion and subdividing said material into two annular streams, and an annular common portion receiving said annular streams and discharging said material in a continuous tubular strand at an annular mouth of said extrusion head at the opposite axial end thereof, said coaxial portions of the flow channel having a combined flow cross section greater than the flow cross section of said common portion, said flow channel progressively narrowing in cross section at least over the entire length thereof from said coaxial portions to said mouth.

4,509,908
APPARATUS FOR UNIFORMLY DEBOSSING AND APERTURING A RESILIENT PLASTIC WEB

William I. Mullane, Jr., Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 230,488, Feb. 2, 1981, Pat. No. 4,441,952.
This application Aug. 2, 1983, Ser. No. 519,614
Int. Cl.³ B29C *17/04*
U.S. Cl. 425—290 13 Claims



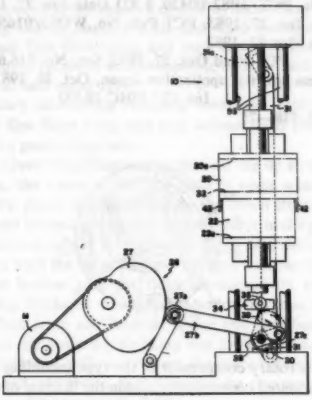
1. A forming cylinder for imparting an uninterrupted, uniformly apertured, fine scale three-dimensional pattern to a heated plastic film subjected to a fluid pressure differential while in contact with its surface, said cylinder comprising a tubular shaped structure exhibiting a three-dimensional continuum of capillary networks about its periphery, each of said capillary networks placing the outermost and innermost surfaces of said tubular member in exclusive fluid communication with one another, each of said capillary networks having an overall length greater than the maximum depth to which said film is drawn when subjected to said fluid pressure differential, each of said capillary networks also having a cross-sectional area which varies in size intermediate said outermost and innermost surfaces, said cross-sectional area reaching a minimum at a point intermediate said outermost and innermost surfaces and thereafter increasing in the direction of the innermost surface of said tubular member, said tubular member being supported at its innermost surface by a multiplicity of support members, each of said support members having a land which contacts the innermost surface of said tubular member, the width of said lands being insufficient to completely obstruct said capillary networks at their points of contact with the innermost surface of said tubular structure, said forming cylinder further including means for securing said multiplicity of support members in fixed relation to one another.

4,509,909
CLAMP MECHANISM FOR DIFFERENTIAL PRESSURE THERMOFORMER

Albert W. Arends, Gladwin, Mich., assignor to Leesona Corporation, Beaverton, Mich.

Filed Apr. 14, 1983, Ser. No. 484,858
Int. Cl.³ B29C *17/00*
U.S. Cl. 425—388 8 Claims

1. In a differential pressure forming machine for forming articles in a web of thermoplastic material, said machine having a frame, a male mold and a female mold mounted on said frame for relative movement toward and away from each other, drive means including a rock shaft mounted on said frame for cyclically moving said molds toward and away from each other between a mold closed position wherein said molds are in opposed adjacent face-to-face relationship with each other and a mold open position wherein said molds are in spaced relationship to each other, said female mold having mold cavity defining means therein located within a given area on the face of said female mold facing said male mold, and said male mold having plug assist means adapted to project into said cavity means when said molds are in said mold closed position, means synchronized with said drive means for positioning an unformed section of a web of thermoplastic material between said molds when said molds are in said mold open position, and clamping means for clamping said section of said web against saidface of said female mold around the perimeter of said given area upon movement of said molds from said mold open position; the improvement wherein said clamping means comprises clamping ring means mounted on said frame for movement independently of said molds to and from a clamping position wherein said ring means is operable to clamp

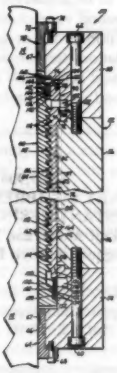


said web against said face of said female mold around the perimeter of said given area, and cam means mounted on said rock shaft engageable with cam follower means coupled to said clamping ring means for driving said clamping ring means to and from said clamping position in movement synchronized with the opening and closing of said molds.

4,509,910
COLUMN CLAMPING ASSEMBLY

Paul S. Petersen, Minnetonka, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Nov. 18, 1983, Ser. No. 553,363
Int. Cl.³ B29F *1/00*
U.S. Cl. 425—451.9 20 Claims



1. A clamp assembly for securing a member from relative longitudinal movement with respect to a column comprises:
a clamp sleeve slidable longitudinally with respect to a column, the clamp sleeve having an outer surface and an inner surface having a cross-section mating the cross-section of said column for selectively engaging said column;
a housing portion adapted to be attached to a member and positioned about the clamp sleeve and having a first por-

tion mating with the clamp sleeve and which in combination with the outer surface of the clamp sleeve defines a sealed chamber therebetween surrounding the clamp sleeve;

means for limiting movement of the clamp sleeve longitudinally with respect to the housing portion including a plurality of longitudinally spaced, latterly engaged surfaces respectively on the outer surface of the clamp sleeve and on the first portion for the housing portion; and

means for selectively supplying pressurized fluid to the chamber between the housing and the clamp sleeve which causes the clamp sleeve to shrink so that the inner surface thereof engages the column to secure the clamp sleeve, housing portion and attached member with respect to the column.

4,509,911

COUPLING STRUCTURE AND METHOD AND APPARATUS FOR ITS MANUFACTURE

Larry A. Rosenbaum, Findlay, Ohio, assignor to Hancor, Inc., Findlay, Ohio

Division of Ser. No. 356,939, Mar. 11, 1982, Pat. No. 4,480,855. This application Jul. 11, 1983, Ser. No. 512,368

Int. Cl.³ B29C *17/07;* B29D *23/03*

U.S. Cl. 425—532 **4 Claims**

1. An apparatus for manufacturing a continuous length of internal plastic couplers interconnected end to end, the apparatus comprising:

extrusion means for extruding a softened plastic sleeve;

continuous molding means for molding the softened plastic sleeve into the continuous length of interconnected internal couplers, the continuous molding means including at least two runs of mold blocks which come together around the softened plastic sleeve for continuously blow-molding the softened plastic sleeve into the length of interconnected couplers, the mold blocks including:

a plurality of corrugation defining recesses disposed at regular intervals therealong and extending generally peripherally around the plastic sleeve for defining outward extending ribs centrally around each internal coupler,

a plurality of cleat defining recesses disposed to either side of the central corrugation defining recess for defining a plurality of outward projecting cleats,

a plurality of frangible portion defining recesses extending generally peripherally around the plastic sleeve, each frangible portion defining recess being disposed generally midway between adjacent central corrugation defining recesses, each frangible portion molding recess being relatively deep as compared to its longitudinal width such that a relatively short section of the softened plastic sleeve is spread over a relatively large surface area thinning the plastic received therein, and

a plurality of ridge defining recesses each partially circumscribing an associated cleat defining recess, each ridge defining recess extending in part between the associated cleat defining recess and the closest central corrugation defining recess.

4,509,912

COMBUSTION EFFICIENCY IMPROVING APPARATUS

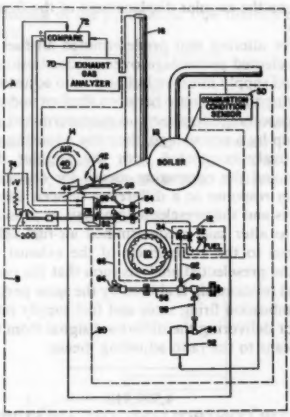
Robert A. VanBerkum, 117 Fernwood Rd., Chagrin Falls, Ohio 44022

Continuation-in-part of Ser. No. 162,628, Jun. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 949,899, Oct. 10, 1978, Pat. No. 4,264,297, which is a division of Ser. No. 750,647, Dec. 15, 1976, Pat. No. 4,157,238. This application Jan. 8, 1982, Ser. No. 338,080

The portion of the term of this patent subsequent to Apr. 28, 1998, has been disclaimed.

Int. Cl.³ F23N *5/00*

U.S. Cl. 431—76 **20 Claims**



1. A combustion apparatus comprising:

at least one combustion chamber adapted to oxidize fuel to produce heat and oxidation by-products at least partially in the form of exhaust gases;

a fuel supply for supplying fuel to said combustion chamber, said fuel supply including a fuel regulator for regulating the rate at which fuel is supplied to the combustion chamber;

an air supply for supplying air to said combustion chamber, said air supply including an air regulator for regulating the rate at which air is supplied to the combustion chamber;

a combustion control for controlling the combustion firing rate including controlling the fuel supply rate at which fuel is supplied to the combustion chamber and controlling the air supply rate at which air is supplied to the combustion chamber, said combustion control constraining said fuel supply rate and said air supply rate to a predetermined air-fuel volume relationship, said combustion control including a jackshaft, means for controlling angular displacement of the jackshaft in accordance with a selected combustion chamber load, a mechanical linkage means at least connecting the jackshaft with one of the fuel regulator and the air regulator;

an exhaust gas analyzer for analyzing at least a part of exhaust gases from the combustion chamber;

a comparing means for comparing results of the exhaust gas analysis with a preselected analysis and producing a difference signal indicative of a difference between the exhaust gas analysis and the preselected analysis;

a first rotatable shaft, the mechanical linkage means further connecting the jackshaft with the first shaft such that the first shaft is angularly displaced with angular displacement of the jackshaft to an angular position corresponding to the controlled combustion firing rate;

a second rotatable shaft which is connected by the mechanical linkage means with one of the fuel regulator and the air regulator for controlling the supply rate of said one of the

fuel and air supply in accordance with the angular position of the second shaft such that the fuel flow and airflow to the combustion chamber are constrained mechanically to a set air-fuel volume relationship and such that rotating the jackshaft changes the fuel and air supply rates while maintaining for each firing rate the preselected relationship between oxygen supplied for combustion and the supplied combustibles requirement for oxygen in the combustion process;

an angular displacement means connected with the first and second shafts such that angular displacement of the first shaft causes a corresponding angular displacement of the second shaft, the angular displacement means having an effective gear ratio which defines the correspondence between the angular displacement of the first and second shafts;

means for altering said predetermined air-fuel relationship by a selected percentage over all combusion firing rates and fuel supply rates, including a ratio adjusting means for adjusting the gear ratio between the first and second shafts by a percentage to alter said predetermined air-fuel relationship by a percentage, the ratio adjusting means being operatively connected with the angular displacement means and the comparing means for adjusting the gear ratio in response to a difference betwen the exhaust gas analysis and the preselected analysis at preselected firing rates to alter said predetermined air-fuel relationship in response to the comparison of the exhaust gas analysis with the preselected analysis such that the predetermined air-fuel relationship is altered by the same percentage over all combustion firing rates and fuel supply rates; and,

means for delivering the difference signal from the comparing means to the ratio adjusting means.

4,509,913

DEVICE FOR CONTROLLING THE AIR SUPPLY FOR A GAS BURNER

Werner Lorenz, Essen; Heinz Bathke, Borken, and Hans Sommers, Essen, all of Fed. Rep. of Germany, assignors to Gaswarme-Institut e.V. and Ruhrgas AG, both of Essen, Fed. Rep. of Germany

Division of Ser. No. 240,864, Mar. 5, 1981, Pat. No. 4,396,371. This application Jan. 4, 1983, Ser. No. 455,490

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1980, 3010014

Int. Cl.³ F23N *1/00*

U.S. Cl. 431—90 **7 Claims**

1. A gas burner installation comprising:

housing means formed with an air intake at atmospheric pressure, a combustion chamber, a passage connecting said intake with said combustion chamber and a passage connected to said combustion chamber for discharging combustion gases;

a gas supply conduit opening into said housing in the region of said combustion chamber for supplying fuel gas thereto;

a flow control member cooperating with one of said passages and displaceable to control the air flow from said intake to said combustion chamber, said member being provided with means for displacing said member as a function of the air flow rate;

sensing means responsive to the gas flow in said conduit; and

means connected to said sensing means for displacing said member so as to maintain a substantially constant ratio of air to fuel gas supplied to said combustion chamber, said flow control member being formed as a rotatable flap, said passage between said intake and said combustion chamber being provided with a flow constricting disk connected to said flap, said sensing means including a manometer responsive to a gas pressure differential and connected to said disk.

4,509,914

APPARATUS FOR THE COMBUSTION OF LIQUID FUELS IN THE GASEOUS STATE

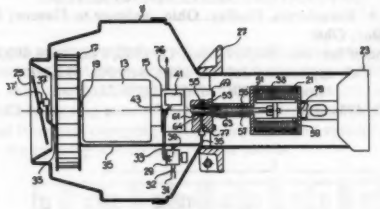
Adolf Frick, Balzers, Liechtenstein, assignor to Stoechio-Matic AG, Schaan, Liechtenstein

Filed Dec. 8, 1982, Ser. No. 447,848

Claims priority, application Switzerland, Dec. 14, 1981, 7960/81

Int. Cl.³ F23D *11/38*

U.S. Cl. 431—121 **3 Claims**



1. An apparatus for preventing the discharge of gasified fuel from an output nozzle of a gasification chamber of a fuel burning burner when said burner is switched off, comprising:

(a) a gasification chamber;

(b) heating means proximate said gasification chamber for gasifying liquid fuel in said gasification chamber;

(c) means for communicating liquid fuel to a first port of said gasification chamber;

(d) pump means having an input port selectively connectable to a second port of said gasification chamber and to a source of liquid fuel; and,

(e) valve means for selectively terminating the supply of liquid fuel to said pump means and connecting said second port of said gasification chamber to said input port of said pump, thereby sucking said gasified fuel from said gasification chamber.

4,509,915

LIQUID FUEL COMBUSTION APPARATUS

Hirosato Ito, Osaka, Japan, assignor to Osaka Gas Company Limited, Osaka, Japan

Filed Sep. 9, 1982, Ser. No. 416,249

Claims priority, application Japan, Sep. 21, 1981, 56-150331; Sep. 21, 1981, 56-150332

Int. Cl.³ F23D *11/00*

U.S. Cl. 431—215 **2 Claims**

1. A combustion apparatus comprising:

a combustion chamber;

a burner adapted to be installed in an opening in said combustion chamber, said burner comprising:

an external casing having a peripheral wall;

an internal casing having a peripheral wall and an outer end wall closing said internal casing peripheral wall, said internal casing being positioned within said exter-

nal casing and defining therewith a secondary air channel; and

a fuel spraying cylinder extending through said outer end wall and positioned within said internal casing and defining therewith a primary air channel;

a source of liquid fuel;

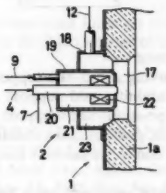
a source of gaseous fuel;

means for supplying liquid fuel from said liquid fuel source into said fuel spraying cylinder;

means for supplying gaseous fuel from said gaseous fuel source into said fuel spraying cylinder and thereby atomizing said liquid fuel, thus forming a mixture of atomized liquid fuel and gaseous fuel;

means for generating oxygen-enriched air, said generating means comprising an oxygen permselective membrane, and duct means for supplying air to an upstream side of said membrane, whereby oxygen-enriched air passes through said membrane to a downstream side thereof;

means for supplying said oxygen-enriched air as primary air from said downstream side of said membrane through said



outer end wall of said internal casing and into said primary air channel, and a fixed vane on the exterior of said fuel spraying cylinder, whereby said primary air travels along said fuel spraying cylinder and is agitated by said fixed vane, and whereby said mixture burns first in said combustion chamber with the thus agitated said primary air;

means for supplying atmospheric air as secondary air through said peripheral wall of said external casing and into said secondary air channel, whereby said secondary air spreads out into the entire interior of said external casing and is supplied to said opening, and whereby remaining of said mixture then burns in said combustion chamber with said secondary air;

exhaust means for withdrawing exhaust gases from said combustion chamber; and

means for passing said air in said duct means in heat exchange relation with said exhaust gases, thereby increasing the temperature of said air supplied to said upstream side of said membrane, and thereby increasing the amount of oxygen of said oxygen-enriched air at said downstream side of said membrane.

4,509,916

DEVICES FOR PRODUCING IGNITION SPARKS WHEN FALLING ON A PYROPHORIC FLINT

Guy Laforest Le Boudec, Barcelona, Spain, assignor to Laforest, S.A., Barcelona, Spain

Filed Jan. 11, 1984, Ser. No. 570,026

Claims priority, application Spain, Mar. 11, 1983, 520.550

Int. Cl.³ F23Q *1/02*

U.S. Cl. 431—273 **1 Claim**

1. Improvements in devices for producing ignition sparks when falling on a pyrophoric flint, essentially characterised by a coil spring having one or various coils, which is provided with a pitting in a transversal or inclined direction made on the outer longitudinal line of the coils thereof, said pitting being formed of "saw-teeth" type projections which protrude from the original core of the coil, thereby forming on the outer surface of the coil spring cutting projections which, when falling on a pyrophoric flint applied to the outside of the coil spring and when said coil spring turns about its axis, produce a

tangential hauling of the pyrophoric flint thereby emitting the ignition spark.

4,509,917

DEVICE FOR REMOVING GRATE SCREENINGS

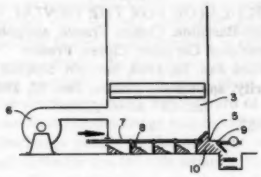
Hans-Jürgen Ubert, Hamburg, Fed. Rep. of Germany, assignor to Claudius Peters AG, Fed. Rep. of Germany

Filed May 6, 1983, Ser. No. 492,386

Claims priority, application Fed. Rep. of Germany, May 13, 1982, 3217969

Int. Cl.³ F23J *1/02*

U.S. Cl. 432—75 **2 Claims**



1. A device for removing grate screenings from a cooling chamber comprising:

a transfer channel beneath the grate;

a removal opening in the side of said cooling chamber which is fitted with a non-return door whereby air pressure is maintained;

a means for removing the grate screenings horizontally through said transfer channel comprising a thrust beam provided with scoops where said scoops fold about an articulated suspension on the return stroke; and

a plug of grate screenings formed in front of the removal opening which aids in maintaining air pressure.

4,509,918

APPARATUS FOR THE ORTHODONTIC TREATMENT OF TEETH

William J. Clark, Lundin Lea, Leven Rd., Lundin Links, Fife, KY8 6AJ, Scotland

Filed Apr. 22, 1983, Ser. No. 487,929

Claims priority, application United Kingdom, Apr. 22, 1982, 8211707; Mar. 7, 1983, 8306192

Int. Cl.³ A61C *7/00*

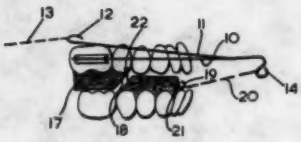
U.S. Cl. 433—5 **14 Claims**

1. Apparatus for the orthodontic treatment of teeth for the correction of malocclusion of a patient having upper and lower dental arches, said apparatus comprising:

(a) a face bow comprising an inner bow, an outer bow adapted when in use to be located externally of the patient for the application of traction thereto, and forwardly projecting first attachment means disposed externally of the patient;

(b) first and second securing means, said first securing means for securing said face bow to one of the upper or lower

dental arches of the patient, said second securing means secured to the other dental arch and comprising second attachment means disposed rearwardly of said first attachment means; and



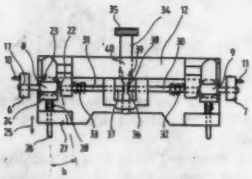
(c) elastic traction means connected between said first and second attachment means for effecting inter-maxillary traction between the upper and lower dental arches, while exerting a rearwardly directed force on said first securing means and a forwardly directed force on said second securing means.

4,509,919

ARTICULATOR FOR THE DENTAL ART

Pierre Gerbellot-Barrillon, Cluses, France, assignor to Fabrications Automatiques Gerbelot, Cluses, France

Filed Jan. 10, 1984, Ser. No. 569,768
Claims priority, application France, Jan. 12, 1983, 83 00793
Int. Cl.³ A61C *11/00*
U.S. Cl. 433—57 **13 Claims**



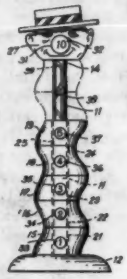
1. An articulator apparatus for the dental art, comprising a lower member whose front part forms a lower platen and supports an incisive plate, and whose rear part comprises two legs supporting two condylar balls forming ball joints on each of which is articulated a upper member comprising a rear hub having appropriate housings for housing the condylar balls, the upper member comprising an upper platen integral with the hub and whose front part receives an incisive rod bearing on the incisive plate, the housings of the hub being limited by a flat upper guide ramp slanting forwardly by an angle reproducing the condylar slope, by a lateral ramp and by a rear wall allowing the transverse movements of the condylar balls, the articulator further comprising means for selectively obtaining locking thereof in centered relation, wherein the centered relation locking is provided by means of two rods sliding transversely in the hub, moveable between a closed up position in which they release the condylar balls, allowing the immediate lateral displacement of the upper member due to the fact that the spacing between the condylar balls is greater than the spacing between the lateral ramps and a spaced apart position in which the rods bear without play against the condylar balls symmetrically with relation to the median longitudinal plane of the upper member, a control member for operating the rods and holding them in one or other position.

4,509,920

EDUCATIONAL TOY FOR TEACHING ALPHANUMERIC SEQUENCES

Robert Kaufmann, 84-11 168th Pl., Jamaica, N.Y. 11432

Filed May 7, 1984, Ser. No. 607,814
Int. Cl.³ G09B *1/06*
U.S. Cl. 434—159 **17 Claims**



1. A toy, comprising

support means having a rod-like support member and base means for maintaining said support member in substantially upright position, said support member having an axis, axial length, guide means extending along said length and a free top end at its farthest distance from said base means;

a plurality of body members each having an axial bore formed therethrough whereby each of said body members is removably slidably mounted on said support member and each having directing means for cooperating with said guide means in a manner whereby each of said body members rotates about the axis of said support member in a first direction of rotation when it slides on said support member toward said base means and in a second direction of rotation, opposite said first direction, when it slides on said support member away from said base means thereby providing variable motion of said body members to interest young children playing with said toy; and

a top member having an axial bore formed therein whereby said top member is removably slidably mounted on said support member and having directing means for cooperating with said guide means at said top end of said support member in a manner whereby said top member rotates about the axis of said support member in said first direction of rotation when it slides on said support member toward said base means and in said second direction of rotation when it slides on said support member away from said base means thereby providing variable motion of said top member to interest young children playing with said toy.

4,509,921

METHOD OF USING SKI TRAINING HALTER

Sue Buchheister, P.O. Box 80, and Ann Poulson, P.O. Box 132, both of Fraser, Colo. 80442

Division of Ser. No. 236,671, Feb. 20, 1981, Pat. No. 4,424,040.
This application Dec. 19, 1983, Ser. No. 562,989
Int. Cl.³ G09B *19/00*
U.S. Cl. 434—253 **1 Claim**

1. The method of restraining and controlling one skier on one set of skis by a second skier on a separate set of skis, comprising the steps of:

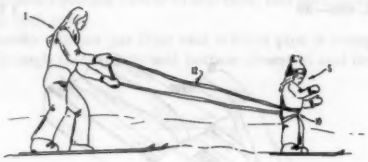
positioning the second skier behind the first skier a sufficient distance such that the respective first and second skier's skis cannot contact each other;

extending one elongated flexible member from the second skier to the first skier's right hip and across the first skier's

front abdomen to the first skier's left thigh and anchoring it there;

extending another elongated flexible member from the second skier to the first skier's left hip and across the first skier's front abdomen to the first skier's right thigh and anchoring it there;

applying rearward forces on both of said flexible members equally to restrain the first skier's forward motion;



applying a greater rearward force on the right flexible member than the left flexible member to induce the first skier to turn right; and

applying a greater rearward force on the left flexible member than the right flexible member to induce the first skier to turn left.

4,509,922

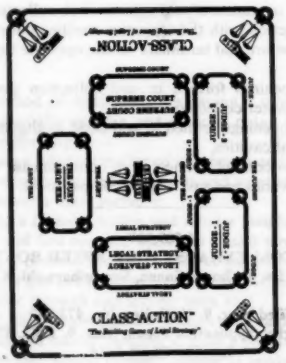
LEGAL EDUCATIONAL GAME AND METHOD OF TEACHING LEGAL SUBJECT MATTER

Carl W. Battle, 2681 Mull Ave., Akron, Ohio 44321

Filed May 14, 1984, Ser. No. 610,025

Int. Cl.³ G09B *19/00*; A63F *9/18*

U.S. Cl. 434—322 **4 Claims**



1. A legal educational game for minors adaptable for teaching a variety of legal topics essentially comprising in combination

(1) a plurality of sets of cards each set being of a different color, wherein said cards contain printed thereon simple legal words or phrases, and each of said sets of cards individually represent a segment of the judicial system and contain printed thereon words or markings indicating said segment of the judicial system, said segments selected from the group consisting of the jury, judge, supreme court, lawyer and legal strategy;

(2) a gameboard means, wherein said gameboard contains a plurality of discrete and discontinuous demarcations which represent segments of the judicial system, and are used for the placement and holding said cards; and

(3) printed instructional means separate from said gameboard, whereby a plurality of participants pull one or more cards from one or more of said sets of cards, and use the simple legal words or phrases printed on the pulled cards to pull additional cards according to a predetermined non-random system, wherein said simple legal words or phrases have the simulated effect in said game as in an actual court case.

4,509,923

MARINE JET PROPULSION UNITS

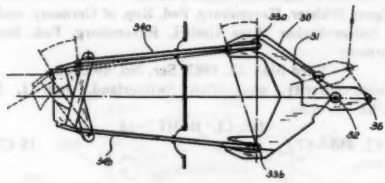
Robert S. Turnbull, Christchurch, New Zealand, assignor to C.W.F. Hamilton & Company Limited, Christchurch, New Zealand

Filed Nov. 10, 1981, Ser. No. 320,149

Claims priority, application New Zealand, Dec. 9, 1980, 195791

Int. Cl.³ B63H *11/10*

U.S. Cl. 440—43 **7 Claims**



1. Hydraulic jet propulsion apparatus incorporating steering means comprising two steering deflectors diametrically opposed and operable to deflect horizontally in either direction a jetstream emerging from a discharge nozzle, each said steering deflector being pivotally mounted, each pivot being located adjacent to the discharge nozzle but forward of the mergence of the jetstream from the discharge nozzle and on the opposite side of the discharge nozzle to the deflector with the inner surface of each deflector (on the side adjacent to the jetstream) being a surface of revolution about an axis which is close to the pivot axis for the deflector and a control mechanism to control of the movement of said steering deflectors so that only one steering deflector is moved into the path of the jetstream at a time while the other steering deflector remains stationary or nearly stationary and clear of the jetstream and the steering deflector acting upon the jetstream has totally withdrawn before the other steering deflector is activated.

4,509,924

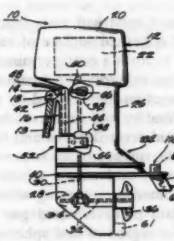
CONTROL SYSTEM FOR TORQUE CORRECTING DEVICE

Charles B. Hall, Ingleside, Ill., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Dec. 20, 1982, Ser. No. 451,438

Int. Cl.³ B63H *21/26*

U.S. Cl. 440—51 **12 Claims**



1. A marine propulsion device comprising a propulsion unit, a transom bracket adapted to be fixedly connected to a boat

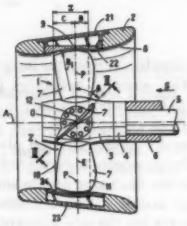
transom, a swivel bracket mounted on said transom bracket for pivotal movement about an axis which is horizontal when said transom bracket is boat mounted, king pin means mounted on said swivel bracket for pivotal steering movement of said propulsion unit, mounting means for mounting said propulsion unit on said king pin means and permitting limited rotational movement of said propulsion unit relative to said king pin means, torque correcting means, means for mounting said torque correcting means on said propulsion unit for pivotal movement about an axis transverse to said horizontal axis, and linkage means for displacing said torque correcting means about said transverse axis in response to rotational movement of said propulsion unit relative to said king pin means.

4,509,925

MARINE VESSEL PROPELLER WITH NOZZLE

Wolfgang Wührer, Ravensburg, Fed. Rep. of Germany, assignor to Sulzer-Escher Wyss GmbH, Ravensburg, Fed. Rep. of Germany

Filed May 23, 1983, Ser. No. 496,926
Claims priority, application Switzerland, Jun. 1, 1982, 3352/82
Int. Cl.³ B63H *5/14*
U.S. Cl. 440—67 **18 Claims**



1. A marine vessel propeller with nozzle through which flows water comprising:

a propeller defining a propeller axis;

vanes each defining a vane axis and each pivotable about their corresponding vane axis into a selectable predetermined angular position to form a predetermined angle of attack;

said vane axes intersecting at an intersection point located on said propeller axis;

each said vane extending to both sides of said vane axis and forming an outer edge defined by a domed outer surface;

said domed outer surface substantially forming portions of a spherical surface possessing a central point and a radius;

said central point being located at said intersection point;

said nozzle comprising an inner surface provided with a substantially spherical zone possessing a radius and a central point which is also located at said intersection point;

said radius of said spherical zone being greater than said radius of said spherical surface of said domed outer surface in order to form a predetermined gap;

said spherical zone extending upstream and downstream of a circular intersection line formed by the intersection of a surface described by said vane axes during rotation of said vanes about said propeller axis and said spherical zone;

said domed outer surface of each pivotable vane and said spherical zone of said nozzle which form therebetween said predetermined gap coacting with one another such as to maintain said predetermined gap essentially constant throughout the region of said spherical zone irrespective of the angular position assumed by said pivotable vane;

said domed outer surface of each said vane possessing ends and said spherical zone provided at said inner surface of said nozzle forming margins; and

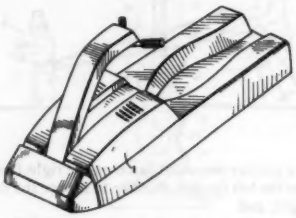
said ends and said margins substantially coinciding at the largest vane angle of attack.

4,509,926

SUPER VENTILATOR JET SKI ENGINE HOOD (BOAT)

Clayton J. Jacobson, Box 5338, Parker, Ariz. 85344

Filed Feb. 25, 1982, Ser. No. 352,084
Int. Cl.³ B63B *17/00*
U.S. Cl. 440—89 **1 Claim**



1. In a waterborne vehicle provided with a upwardly open engine compartment and a releasable hood characterized by a forward edge and lateral sides and dimensioned to form an upper closure for said engine compartment the improvement comprising;

a generally horizontal peripheral duct structure formed on the interior of said hood, characterized by lower collection cavities (traps) communicating with lateral raised aspiration cavities along the sides of said hood, said collection cavities being deployed at a lower level that said aspiration cavaties to collect water therefrom in the course of operation of said vehicle, each collection cavity in conjunction with the aspiration cavities transverse the hood structure and terminate on the opposite side of said hood;

drainage openings formed in said collection cavities for draining water collected therein;

ventilation openings formed in said hood in alignment over said lateral cavities;

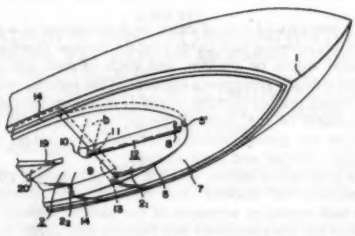
an aspiration conduit connected to communicate with said lateral cavaties and said engine compartment.

4,509,927

BOTTOM EXHAUST HIGH SPEED BOAT

Akira Ikeda, 22-6, 4-Chome, Sonan, Sagamihara-shi, Kanagawa-ken, Japan

Filed Mar. 9, 1983, Ser. No. 473,749
Claims priority, application Japan, Mar. 9, 1982, 57-35747
Int. Cl.³ B63B *1/34*
U.S. Cl. 440—89 **4 Claims**



1. A bottom exhaust speed boat comprising:

a hull having a bow, a keel and a bottom;

an engine in said hull and having an exhaust pipe;

a grooved portion recessed in said hull bottom and symmetric about said hull keel line, said grooved portion being separated from the remainder of said bottom by a first stepped surface, said exhaust pipe opening into said grooved portion, whereby said grooved portion becomes filled with exhaust gas; and

a duct fixed to the surface of said hull and extending between said opening of said exhaust pipe and a portion of said grooved portion closest to said bow, said duct being open at both ends,

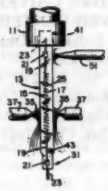
whereby exhaust gas from said exhaust pipe is transported through said duct to said portion closest to said bow.

4,509,928

METHOD OF MAKING HIGH PRESSURE TUNGSTEN HALOGEN LAMPS

Merle E. Morris, Lexington; Steven L. Meade, Winchester, and Lawrence M. Rice, Lexington, all of Ky., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 30, 1983, Ser. No. 480,529
Int. Cl.³ H01J 9/395
U.S. Cl. 445—27 **22 Claims**



1. A method of making a lamp having a tubular envelope with substantially regular and smooth outer surfaces, said method comprising:

providing a tubular member of vitreous material having first and second opposed open ends and substantially regular and smooth outer surfaces;

orienting a filament within said tubular member;

sealing said first opposed open end of said tubular member;

flowing a predetermined quantity of gas mixture including an inert gas and a halogen compound within said tubular member through said second open end;

cooling said predetermined quantity of said gas mixture within said tubular member to form a pool of liquified gas within said tubular member capable of producing a predetermined internal pressure within said tubular member upon sealing of said tubular member and gasifying of said pool, said cooling of said gas mixture creating a vacuum within said tubular member;

flowing a quantity of nitrogen gas established at a pressure of substantially one atmosphere into said tubular member through said second open end; and

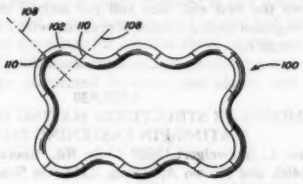
sealing said second open end of said tubular member having said pool of liquified gas therein to form said tubular envelope, said liquified pool thereafter gasifying within said envelope to produce said predetermined internal pressure within said envelope, the overall internal pressure within said sealed envelope being substantially equal to the sum of said one atmosphere of said nitrogen gas and said predetermined internal pressure produced by said pool of liquified gas, the combined atmosphere contained within said sealed envelope including said inert gas, halogen, and nitrogen.

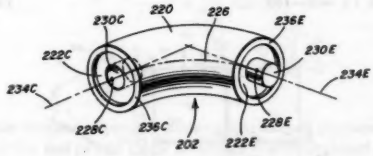
4,509,929

ANNULAR SUPPORT DEVICE WITH PIVOTAL SEGMENTS

Richard E. Zawitz, 109 Alton St., San Francisco, Calif. 94115

Filed Aug. 27, 1982, Ser. No. 412,118
Int. Cl.³ A63H 33/12
U.S. Cl. 446—102 **20 Claims**





1. A continuous annular device which may be twisted into an infinite variety of configurations, comprising:

a plurality of serially connected rigid segments having a first end pivotally secured to one of the two adjacent segments, and a second end pivotally secured to the other one of the two adjacent segment, permitting each segments to be twisted relative to the two adjacent segments causing the annular device to assume any one of an infinite number of configurations, each configuration having a continuous center line therearound;

a first end face on the first end of each segment, which end face is normal to the center line of the annular device defining a first interface plane for each segment, the first end of each segment forming a first interface with the cooperating end of the one of the two adjacent segments along the first interface plane with a pivot axis therethrough normal to the first interface plane;

a second end face on the second end of each segment, which end face is normal to the center line of the annular device defining a second interface plane for each segment, the second end of each segment forming a second interface with the cooperating end of the other one of the two adjacent segments along the first interface plane with a pivot axis therethrough normal to the first interface plane;

a first engagement means on the first end face of each segment; and

a second engagement means on the second end face of each segment for engaging the first engagement means on the other one of the two adjacent segments for securing the plurality of segments together;

the first engagement means is a cylindrical central extension means extending from the first end face;

the second engagement means is a cylindrical central channel means extending into the second end face for pivotally engaging the extension means on the other one of the two adjacent segments,

the extension means has an outward extending radial engagement means for engaging the channel means to pivotally secure the adjacent segments together;

the channel means has an outwardly extending radial surface for engaging the radial engagement means on the extension means;

the center axis of the cylindrical extension means is coinci-

dent with the center axis of the cooperating cylindrical channel means on the one adjacent segment forming a common pivot axis;

the continuous center line around the annular device is a line of radial symmetry around the annular device;

the coincident center axes are also coincident with the center line of radial symmetry at the interface plane between adjacent segments; and

both the first end face and the second end face on each segment have a central depression with a raised circumferential rim.

4,509,930

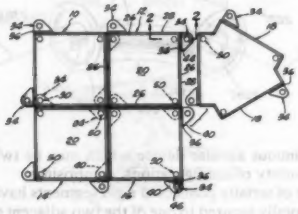
MODULAR STRUCTURES HAVING HINGE AND MATING PIN FASTENING MEANS

Lothar L. Schweigert, 3609 Cody Rd., Sherman Oaks, Calif. 91403, and Heimo A. Knaus, 1219 Via Sendero, Escondido, Calif. 92025

Continuation of Ser. No. 899,524, Apr. 24, 1978, abandoned. This application Nov. 28, 1979, Ser. No. 98,268

Int. Cl.³ A63H *33/08*

U.S. Cl. 446—109 **11 Claims**



1. A fastening device for releasably connecting one member to another, the combination including:

a. a member having surfaces terminating in a member edge,

b. a tab extending outwardly from but not overlapping said member edge, said tab having a tab edge positioned adjacent to said member edge, said tab being offset from the plane of said member and having an opening therethrough,

c. hinge means positioned where said member edge and said tab edge are adjacent to each other for hinging together said member and said tab, said hinge means permitting said tab to swing from planar alignment of said tab with said member, into various angular positions,

d. a pin extending and supported from the surface of said member, said pin being positioned inwardly from said member edge so that said pin is offset along said member edge from which said tab extends, and

e. said pin and said tab being adapted to be connected to respective tab and pin means similarly arranged on another member in order to secure said members together.

4,509,931

POWERED TOY VEHICLE WITH PIVOTABLE AXLE MOUNTING

Gérard L. Lambert, and Gary M. Saffer, both of Torrance, Calif., assignors to Mattel, Inc., Hawthorne, Calif.

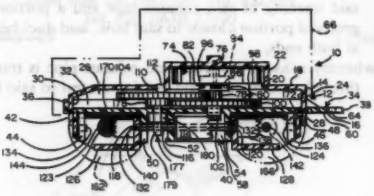
Filed Jan. 5, 1983, Ser. No. 455,686

Int. Cl.³ A63H *29/20, 17/26*

U.S. Cl. 446—462 **4 Claims**

1. In combination with a toy vehicle having a chassis, motion-imparting apparatus mounted in said chassis, said motion-imparting apparatus having an output member, said vehicle including an axle, at least one ground-engaging wheel coupled to said axle for rotation thereby, and means for coupling said axle to said output member for rotation thereby, the improvement which comprises;

means for coupling said axle to said chassis in a manner such that said axle is free to pivot about an axis normal to the major axis of said axle, and wherein said means for coupling said axle to said output member includes a drive shaft rotatably mounted to said chassis normal to said axle, and wherein said means for coupling said axle to said chassis, comprises:



a journal box for rotatably receiving said axle; a first journal bearing pivotably coupling said journal box to said drive shaft intermediate its ends; and

a second journal bearing pivotably coupling said journal box to said chassis on an axis coinciding with the major axis of said drive shaft.

4,509,932

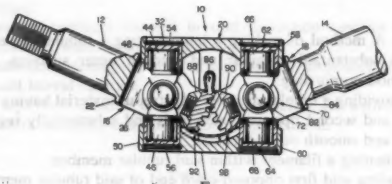
DOUBLE CARDAN UNIVERSAL JOINT WITH IMPROVED CENTERING MEANS

Warren W. Weible, Defiance, Ohio, assignor to The Zeller Corporation, Defiance, Ohio

Continuation of Ser. No. 254,270, Apr. 15, 1981, abandoned, which is a continuation-in-part of Ser. No. 040,774, May 21, 1979, abandoned. This application Jun. 8, 1983, Ser. No. 501,051

Int. Cl.³ F16D *3/32*

U.S. Cl. 464—109 **20 Claims**



1. In a double Cardan type universal joint for connecting two shafts, said universal joint comprising a first end yoke, a second end yoke, a connecting yoke between said first end yoke and said second end yoke, a first cross having two aligned trunnions rotatably held by said first end yoke and having two additional aligned trunnions rotatably held by said connecting yoke, a second cross having two aligned trunnions rotatably held by said second end yoke and having two additional aligned trunnions rotatably held by said connecting yoke, and centering means between said first yoke and said second yoke, the improvement comprising said centering means being at least one first circular tooth and a central tooth which is thicker in transverse cross section than the circular tooth with a first circular groove therebetween, said teeth and groove being carried by said first end yoke and located on a center line coaxial with the axis of rotation of said first end yoke, said teeth and groove also being disposed in the shape of a segment of a sphere with the center being on the point where the axes of the trunnions of said first cross intersect, and second circular teeth, a second circular groove therebetween, and a central recess which is wider in transverse cross section than said second groove, said second teeth, said second groove, and said recess being carried by said second end yoke and located on a

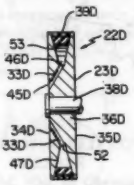
center line coaxial with the axis of rotation of said second end yoke and being disposed in the shape of a segment of a sphere with the center being on the point where the axes of the trunnions of said second cross intersect, outer portions of said teeth having generally involute profiles, said involute profiles being formed on base circles having radii which are from zero to 25% of the tooth height less than the radii of pitch circles of the teeth.

4,509,933

BELT PULLEY AND METHOD OF MAKING THE SAME

Joseph P. Miranti, Jr., Porter Township, Christian County, and James K. Brew, Greene County, both of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Jun. 1, 1982, Ser. No. 383,845
Int. Cl.³ F16H *57/04*
U.S. Cl. 474—93 **10 Claims**



1. In a belt pulley having a hub and a peripheral groove for receiving part of an endless belt therein that is to drive said pulley or be driven thereby whereby said pulley is adapted to be rotated about the axis of said hub, said groove of said pulley defining an annular bottom surface of said groove and a pair of spaced apart angled inside surfaces of said groove that join with said bottom surface and diverge away from each other as said angled surfaces extend away from said bottom surface, said angled surfaces being adapted to be engaged by opposed angled sides of said belt in such a manner that a bottom of said belt will be spaced from said bottom surface, said pulley having opposed outer sides, said pulley having means defining at least one passage means provided with an inlet interrupting one of said opposed outer sides adajcent said hub and an outlet interrupting said bottom surface of said peripheral groove whereby fluid passing through said passage means from said inlet to said outlet thereof will tend to cool said pulley and said belt as said pulley rotates about said axis, the improvement wherein said passage means comprises at least one substantially straight bore connecting the inlet and outlet and having a centerline, said bore being arranged such that upon extension of said centerline through the outlet it will intersect one of said angled side surfaces in close proximity to said bottom surface.

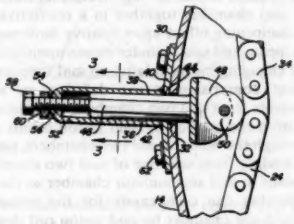
4,509,934

EXTERNAL TRANSFER CASE CHAIN SLACK ADJUSTMENT STRUCTURE

Donald G. Balius, 1003 Caillavet St., Biloxi, Miss. 39530

Filed Aug. 3, 1982, Ser. No. 404,842
Int. Cl.³ F16H *7/12*
U.S. Cl. 474—136 **1 Claim**

1. In combination with a vehicle of the type provided with a driving transfer case including a pair of generally parallel shafts having aligned sprocket wheels mounted thereon drivingly connected by a drive chain trained about said sprocket wheels and wherein said shafts are journalled from a housing enclosing said sprocket wheels and chain and including a downwardly facing lower housing wall generally paralleling a straight path extending between corresponding peripheral portions of said sprocket wheels and along which a reach of said chain extends, a transfer case chain slack adjustment structure, said structure including an elongated sleeve having one open end and a transverse mounting plate mounted on said open end of said sleeve and equipped with an opening formed therein registered with the sleeve open end, the other end of said sleeve being closed, said housing wall having an opening formed therein registered with a midportion of said chain reach, said mounting plate being mounted on the outer surface of said wall portion in position with said openings registered, an elongated shank member projecting through said openings and including a first end slidingly disposed in said sleeve and a second end disposed in said housing, said second end having a roller journalled therefrom for rotation about an axis extending transversely of said shank member and paralleling said shafts, means operably connected between said sleeve and shank



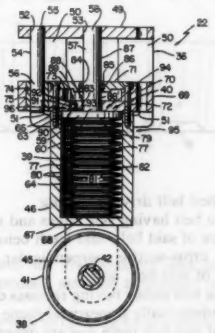
member first end adjustably limiting longitudinal displacement of said first end of said shank member toward the closed other end of said sleeve, said roller being rollingly engaged with and inwardly deflecting the midportion of said chain reach, said sleeve and shank member including coacting means guiding said shank member from said sleeve against angular displacement of said shank member about its longitudinal axis relative to said sleeve, said other end of said sleeve having a threaded bore formed therethrough, said means operably connected between said sleeve and shank comprising a bolt threaded through said bore and having an inner end abuttingly engaged with the opposing end of said shank member.

4,509,935

BELT TENSIONER AND METHOD OF MAKING THE SAME

Randy C. Foster, Springfield; Roger G. Hackard, Sparta, and Leslie B. Wilson, Reeds Spring, all of Mo., assignors to Dayco Corporation, Dayton, Ohio

Filed Aug. 27, 1981, Ser. No. 296,697
Int. Cl.³ F16H *7/12*; F16D *57/00*; F16F *9/14, 9/48*
U.S. Cl. 474—138 **3 Claims**



1. In a tensioner for a power transmission belt that is adapted to be operated in an endless path, said tensioner comprising a support means for being fixed relative to said belt, a belt engag-

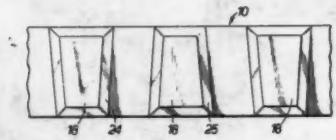
ing means carried by said support means and being movable relative thereto, mechanical spring means operatively associated with said support means and said belt engaging means for urging said belt engaging means relative to said support means and against said belt with a force to tension said belt, and fluid dampening means operatively associated with said support means and said belt engaging means to dampen the movement of said belt engaging means relative to said support means, said dampening means comprising a piston means and a cylinder means having said piston means and a fluid therein, said piston means defining two chambers for said fluid in said cylinder means on opposite sides of said piston means and having a piston rod interconnected to one of said opposed sides thereof and extending through one of said two chambers, said piston means and cylinder means having means that fluidly interconnects said two chambers together in a restrictive manner to provide a dampening effect upon relative movement between said piston means and said cylinder means upon said movement of said belt engaging means relative to said support means, the improvement comprising means defining an accumulator chamber remote from said two chambers, said piston rod being the only piston rod carried by said piston means and not extending through the other of said two chambers, passage defining means leading from said one of said two chambers of said cylinder means to said accumulator chamber so that said accumulator chamber can compensate for the volume changes created in said one chamber by said piston rod that are different from the volume changes created in said other chamber during said relative movement between said piston means and said cylinder means, said passage defining means having a fluid flow restricting first passage means that interconnects said one of said two chambers to said accumulator chamber and a fluid flow non-restricting second passage means that interconnects said one of said two chambers to said accumulator chamber, and one-way check valve means in said second passage means that closes said second passage means only when said belt engaging means is being moved in one direction relative to said support means whereby said dampening means dampens the movement of said belt engaging means with a greater restricting force when said belt engaging means is being moved in said one direction relative to said support means than the restricting force of said dampening means when said belt engaging means is being moved in the opposite direction relative to said support means.

4,509,936

TOOTHED BELT DRIVES

Alexander Müller, Höxter, Fed. Rep. of Germany, assignor to Arntz-Optibelt KG, Höxter, Fed. Rep. of Germany

Filed Sep. 12, 1983, Ser. No. 531,497
Int. Cl.³ F16H 7/00
U.S. Cl. 474—148 **3 Claims**



1. A toothed belt drive including

a strip-like belt having side edges and teeth projecting from a surface of said belt, said teeth being trapezoidal in plan and in cross-section perpendicular to the direction of motion of said belt, and

at least one belt pulley having recesses defined therein which are of substantially trapezoidal shape corresponding to the shape of said belt teeth and are adapted to mesh with said belt teeth,

said belt teeth each having a trapezoidal base in contact with the surface of said strip-like belt, said trapezoidal base having smaller and longer opposite parallel side edges which alternately extend parallel to a respective one of said side edges of said belt, and

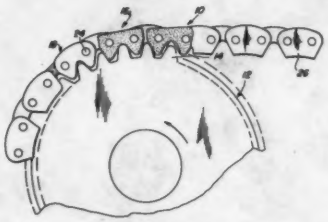
said recesses in said belt pulleys being laterally open at one side which is adjacent the larger side edge of the base of a tooth engaged therein, the other side of said recess being closed.

4,509,937

POWER TRANSMISSION CHAIN

Timothy J. Ledvina, and Robert H. Mead, both of Ithaca, N.Y., assignors to Borg-Warner Corporation, Chicago, Ill.

Continuation of Ser. No. 332,032, Dec. 18, 1981, abandoned. This application Oct. 28, 1983, Ser. No. 546,667
Int. Cl.³ F16G 13/04
U.S. Cl. 474—213 **3 Claims**



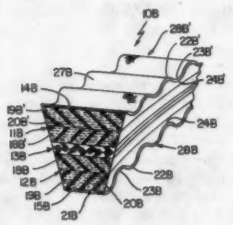
1. A power transmission chain adapted for use in a toothed sprocket drive system comprising: a plurality of links arranged in interleaved sets, pivot means interconnecting the link sets, each link having a back surface, and having a pair of toes defined by converging inside flanks and outside flanks, the inside flanks being joined by a crotch, the links of some of said sets of links being so constructed and arranged to drivingly contact the teeth of a sprocket on the inside flanks of the links and the links of other sets of links being so constructed and arranged to drivingly contact the teeth of a sprocket on the outside flanks of the links, characterized in that the links in one of said sets have an arcuate back surface and the links in others of said sets have a flat, generally planar back surface, thus to differentiate between the types of links.

4,509,938

ENDLESS POWER TRANSMISSION BELT HAVING A TOOTHED COMPRESSION SECTION AND METHOD OF MAKING THE SAME

Carl R. Woodland, Greene County, Mo., assignor to Dayco Corporation, Dayton, Ohio

Continuation of Ser. No. 303,255, Sep. 17, 1981,. This application Sep. 4, 1984, Ser. No. 647,853
Int. Cl.³ F16G 5/00, 1/00, 9/00
U.S. Cl. 474—264 **18 Claims**



1. In an endless power transmission belt having a toothed compression section, said belt being formed substantially of

polymeric materials and comprising a tension section, a compression section, and a load-carrying section disposed between said tension section and said compression section and having a transverse centerline, said compression section having an outer layer and an inner layer joined to said outer layer and defining an interface therewith that is substantially uniformly spaced from said load-carrying section by said outer layer throughout substantially the entire width and length of said belt, said compression section having an inner surface in the form of alternating transverse teeth and grooves with said grooves respectively defining the roots of said teeth, said inner layer of said compression section having a thickness from said interface to the tips of said teeth thereof that is approximately the same as the thickness of said outer layer of said compression section, the improvement wherein said inner layer of said compression section is softer than said outer layer thereof and said roots of said teeth are spaced inwardly from said interface of said layers so that said root of each tooth is spaced from said interface of said layers a distance that is approximately 25% of the distance of that root from said centerline of said load-carrying section whereby said inner layer tends to prevent cracking of said belt in the toothed area thereof.

4,509,939

FOLDING DEVICE FOR WEB-FED ROTARY PRINTING PRESSES

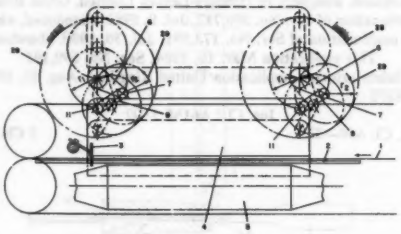
Hans Müller, Leimen, Fed. Rep. of Germany, assignor to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Dec. 7, 1981, Ser. No. 328,008

Claims priority, application Fed. Rep. of Germany, Dec. 6, 1980, 3046051

Int. Cl.³ B65H *45/18*

U.S. Cl. 493—444 **7 Claims**



1. Folding device for web-fed rotary printing presses for forming a longitudinal fold in a direction wherein printed copies are conveyed, the longitudinal fold being producible, after a cylinder-crossfold, by an elongated folding blade disposed parallel to the conveying direction, the folding blade being suspended at opposite ends thereof from two drive cranks which are driven at the same speed of rotation and reciprocatingly movable by the latter; the folding blade, in a bottom position thereof, thrusting the printed copies between two driven folding rollers, the folding device comprising a respective additional crank suspending the folding blade at a respective end thereof from each of the drive cranks, each of the drive cranks having a crank pin and said additional crank, respectively, having a trunnion, said additional crank being supported by said trunnion thereof on and coaxial to said crank pin of the respective drive crank, and a gear train operatively connected with said additional crank for driving said additional crank at the same rotary speed as that of the respective drive crank and in opposite rotary direction thereof so that a crank pin of said additional crank suspending the respective end of the folding blade executes a vertical stroke moving the respective end of the folding blade in the same direction.

4,509,940

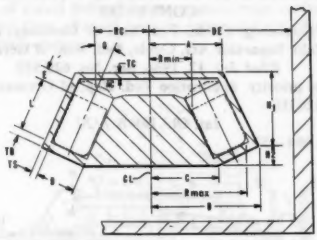
FIXED ANGLE PELLETING ROTOR CONFIGURED TO PROVIDE A MAXIMUM CLEARING RATE FACTOR

William A. Romanauskas, Southbury, Conn., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 262,631, May 11, 1981, abandoned. This application Jul. 13, 1983, Ser. No. 512,950

Int. Cl.³ B04B *7/08*

U.S. Cl. 494—16 **4 Claims**



1. A rotor member rotatable about its central axis CL at an angular speed w, the rotor having n cavities each able to receive a bottle such that a number of bottles N, where N is from 1 to n, are insertable into the rotor, each bottle being able to receive a predetermined volume V of suspension of particles to be pelleted, the particles being responsive to a centrifugal force field to move from a radially inner point in each bottle disposed at a distance R_{min} from the axis CL to a radially outer point in each bottle disposed a distance R_{max} from the axis CL, the rotor member having a clearing rate factor K_R associated therewith, the values of w, V, N, R_{min} and R_{max} being determined such that the clearing rate factor K_R defined by the relationship

$$K_R = \frac{(V)\,(N)\,w^2}{\ln\,[R_{max}/R_{min}]}$$

is a maximum.

4,509,941

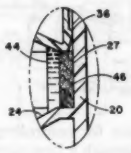
FRACTIONATION DEVICE AND METHOD

Leighton C. Johnson, deceased, late of Edwardsburg, Mich. (by Ann Johnson, Administratrix), assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Nov. 14, 1983, Ser. No. 551,109

Int. Cl.³ B04B *7/16*

U.S. Cl. 494—45 **6 Claims**



1. Centrifuge apparatus for fractionating and separating finely divided solid particulate material suspended in a liquid comprising:

(a) enclosure means having an opening only at the top for the introduction and removal of liquid;

(b) a liner for said enclosure means for trapping inside said liner particulate material present in said liquid; and

(c) means for rotating the enclosure means about the vertical axis thereof, said rotating means consisting essentially of a

holder for said enclosure means which holder is rotated by a motor;

wherein the enclosure means is retained by friction fit inside said holder and wherein the holder has U-shaped cut away surfaces on two opposite sides for the insertion and removal of said enclosure means.

4,509,942

FULLY JACKETED CENTRIFUGE WITH A HELICAL CONVEYOR

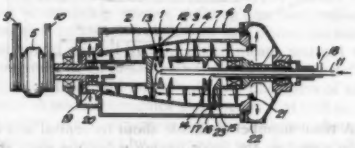
Hubert Gunnewig, Oelde, Fed. Rep. of Germany, assignor to Westfalia Separator AG, Oelde, Fed. Rep. of Germany

Filed Jul. 12, 1984, Ser. No. 629,938

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1983, 3326310

Int. Cl.³ B04B 1/20

U.S. Cl. 494—53 11 Claims



1. In a fully jacketed centrifuge with a helical conveyor for separating mixtures of solids and liquid, wherein the mixture of solids and liquid is fed into the conveyor through a first inlet space having a first access passage and at least some of the centrifuged solids are extracted through extraction apertures located below the surface of the liquid in the jacket of the drum, the improvement comprising: means forming a second inlet space in the vicinity of the extraction apertures and having a second access passage and outlet channels in communication therewith.

4,509,943

INFUSION CONTROL APPARATUS

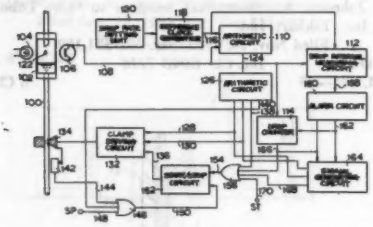
Yoshiki Hanzawa, Fujinomiya, Japan, assignor to Terumo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1982, Ser. No. 404,860

Claims priority, application Japan, Aug. 10, 1981, 56/125045

Int. Cl.³ A61M 5/16

U.S. Cl. 604—31 7 Claims



1. An apparatus for controlling drop-wise infusion of an infusion liquid through a flow passage, wherein a drop chamber is provided upstream of the flow passage, the apparatus comprising:

input means arranged to be operatively associated with the drop chamber for forming an input signal on the basis of a change in a quantity of light received by said input means after the light is passed through falling drops of the infusion liquid in the drop chamber, wherein an absence of said input signal indicates either one of an exhaustion in supply of the infusion liquid or a continuous stream of liquid falling in the drop chamber;

flow adjusting means arranged to interact with the flow passage for adjusting the flow of infusion liquid in the flow passage;

drop interval control means coupled to said input means adapted to evaluate the interval between successive falling drops of infusion liquid in the drop chamber in response to said input signal, for producing a control signal operative to establish a drop interval adjustment mode wherein said flow adjusting means adjusts the flow of infusion liquid to bring said interval into correspondence with a set value;

cut-off means coupled to said drop interval control means and to said flow adjusting means for establishing a liquid cut-off mode wherein the flow of infusion liquid through the flow passage is closed off by said flow adjusting means upon detecting the absence of said input signal over a predetermined period of time, said cut-off means providing a corresponding output to said flow adjusting means; and

drop count means coupled to said input means and to said cut-off means for detecting said input signal after initiation of said cut-off mode, wherein said drop count means produces a signal to restore said flow adjusting means to operate in said drop interval adjustment mode when said input signal indicates a set number of drops have fallen in the drop chamber after the flow of infusion liquid through the flow passage is closed off by said flow adjusting means in said cut-off mode, so that said flow adjusting means remains in said cut-off mode if the supply of infusion liquid is exhausted, and is restored to said drop interval adjustment mode if said set number of drops fall in the drop chamber after the flow passage is closed off in the absence of said input signal over said predetermined period of time.

4,509,944

CATHETER ASSEMBLY

Paul E. King, Ware, and Harold C. S. Wilson, Croydon, both of England, assignors to Hinders-Leslies Limited, Great Britain

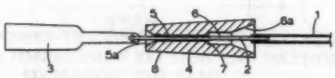
Continuation of Ser. No. 396,717, Jul. 9, 1982, abandoned, which is a continuation of Ser. No. 173,591, Jul. 30, 1980, abandoned.

This application Mar. 16, 1984, Ser. No. 590,191

Claims priority, application United Kingdom, Aug. 15, 1979, 7928375

Int. Cl.³ A61M 5/00

U.S. Cl. 604—53 3 Claims



1. A catheter assembly comprising a hollow needle, a length of catheter tubing with a distal end of said hollow needle removably held within the rearward end of the catheter tubing, the hollow needle itself having a connection hub at its proximal end, and a guide member having a first longitudinal bore communicating with the rearward end of the guide member, the first longitudinal bore being operable to removably fit around the hollow needle so that the guide member is slidable with respect thereto but leaves the distal end of the hollow needle extending beyond said first longitudinal bore in its assembled position, and said guide member further possessing a communicating second longitudinal bore operable to removably accept the catheter tubing extending back from the forward end of the guide member so that the second longitudinal bore of the guide member is slidable with respect to the catheter tubing to permit its removal from the guide member, the second longitudinal bore being of larger diameter than the first longitudinal bore, the interior end of said second longitudinal bore, where it meets the first longitudinal bore, being of the same dimension as the external diameter of the catheter tubing end to thereby form a shoulder in the guide member against which the catheter tubing is held during reconnection, and one

or both ends of the guide member has a portion which is steeply tapered inwards to the longitudinal bore to facilitate placement of the hollow needle and catheter tubing into their respective longitudinal bores and wherein the guide member is operable to grasp the catheter by providing the walls of the guide member with longitudinal slots which extend from the end of the guide member (with the broader portion of the bore) to near the shoulder where the broader and narrower portions of the bore meet so as to leave undistorted the region where the second longitudinal bore communicates with the first, narrow longitudinal bore whereby gradual displacement of the guide member in a forward direction relatively to the hollow needle smoothly disconnects the catheter tubing as the hollow needle distal end is retracted within the first longitudinal bore; while gradual displacement of the guide member and associated length of catheter tube held immobile in relation thereto with its free rearward end located as far as possible within the second bore ensures that the hollow needle reenters the bore of the catheter tubing for smooth reconnection.

4,509,945

CATHETER FOR CATHETERIZING CENTRAL VEINS

Bernhard Kramann, and Meinhard Rust, both of Munich, Fed. Rep. of Germany, assignors to Sterimed Gesellschaft für medizinischen Bedarf mbH, Saarbrücken, Fed. Rep. of Germany

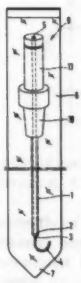
PCT No. PCT/EP82/00270, § 371 Date Aug. 16, 1983, § 102(e) Date Aug. 16, 1983, PCT Pub. No. WO83/02064, PCT Pub. Date Jun. 23, 1983

PCT Filed Dec. 17, 1982, Ser. No. 530,580

Claims priority, application Fed. Rep. of Germany, Dec. 17, 1981, 3150052

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—164 **15 Claims**



1. A catheter for catheterizing central veins via peripheral vein approaches, comprising a catheter tube (1) having an internal diameter of 0.5 to 2 mm, an external diameter of 0.7 to 2.4 mm and a length of 400 to 800 mm, a J-shaped guide wire (3) disposed axially displaceably in the catheter tube, the guide wire having a resilient distal end (4), which is curved over a length of 15 to 30 mm, and a means (9) for limiting the mutual displaceability of the catheter tube (1) relative to the guide wire (3) approximately to the length of the curved distal end (4) of the guide wire (3).

4,509,946

FLOW CONTROL DEVICE

Richard H. McFarlane, 2571 Kaneville Rd., Geneva, Ill. 60134

Filed Sep. 23, 1982, Ser. No. 421,989

Int. Cl.³ A61M *5/00*; A61B *5/02*

U.S. Cl. 604—246 **9 Claims**

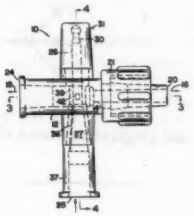
1. A flow control device of the type primarily designed for use with an intravascular pressure monitoring catheter system, said device comprising:

(a) a housing including a first flow channel and a second flow channel interconnected in fluid communication with one another,

(b) said first flow channel structured to establish fluid flow between a patient and a monitoring device, said second flow channel structured and disposed to establish fluid flow between a supply of infusion fluid and said first flow channel,

(c) flow regulator means movably mounted coaxially with said second flow channel for regulating flow of infusion fluid through said second flow channel to said first flow channel,

(d) a continuous path of fluid flow and an intermittent path of fluid flow both disposed along a substantially common path of travel defined between an interior surface of said second flow channel and an outer surface of said flow regulator means,



(e) said continuous path of fluid flow comprising a groove formed in said outer surface of said flow regulator means and said outer surface disposed in substantially mating engagement with said interior surface of said second flow channel along the length of said flow regulator means,

(f) said intermittent path of fluid flow being of greater cross sectional dimension than said continuous path of fluid flow and defined by spaced apart, non-mating disposition of said interior and outer surfaces of said second flow channel and said flow regulator means respectively and along the length of said flow regulator means, and

(g) whereby at least a minimal amount of fluid flow is maintained along said common path of travel independent of the position of said flow regulator means relative to said second flow channel.

4,509,947

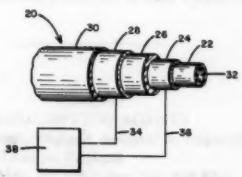
SELF-CLEANING DRUG DELIVERY CATHETER AND STORAGE BLADDER

Gary A. Lattin, Forest Lake, Minn., assignor to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 2, 1982, Ser. No. 404,081

Int. Cl.³ A61M *25/00*

U.S. Cl. 604—266 **1 Claim**



1. A drug delivery catheter comprising a tubular catheter member having an interior surface; and piezoelectric means for cleaning the interior surface of said chamber by applying ultrasonic vibrations to said tubular catheter member; wherein said piezoelectric means comprises a layer of piezoelectric material applied to the tubular catheter member, a first metallized layer intermediate to said tubular catheter member and said layer of piezoelectric material and a second metallized layer external to said layer of piezoelectric material, and means whereby said piezoelectric material may be coupled to a source of ultrasonic electrical signals.

4,509,948

CATIONIC MONO- AND DIS-AZO DYESTUFFS, AND THEIR PREPARATION AND USE FOR DYEING PAPER AND CATIONIC DYEABLE SUBSTRATES

Peter Wild, Odenthal, and Frank-Michael Stöhr, Burscheid, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

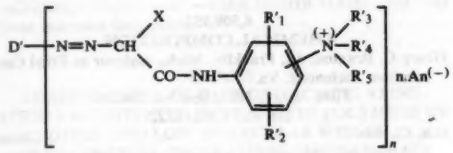
Filed Aug. 5, 1983, Ser. No. 520,675

Claims priority, application Fed. Rep. of Germany, Aug. 24, 1982, 3231398

Int. Cl.[3] C08J 3/20; C09B 29/32; D06P 1/41

U.S. Cl. 8—539 9 Claims

1. Cationic dyestuffs of the formula



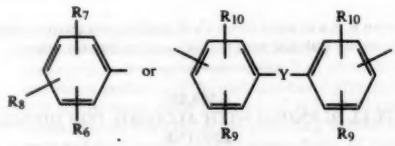
wherein

n is 1 or 2,

X is a radical of the formula $COCH_3$, CN, $COOCH_3$, $COOC_2H_5$, $CONH_2$ or COC_6H_5 and

$An^{(-)}$ is an anion.

D' denotes a radical of the formula



R_1' and R_2' independently of each other denote hydrogen, fluorine, chlorine, bromine, C_1- to C_4-alkyl or C_1- to C_4-alkoxy, and

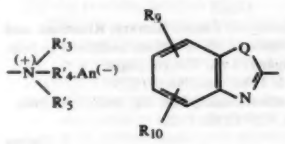
R_3', R_4' and R_5' independently of one another denote C_1- to C_4-alkyl, C_3- to C_4-alkenyl, benzyl or phenylethyl, either of which can be substituted by hydroxyl, C_1- to C_4-alkoxy, chlorine, bromine or cyano, and the benzyl and phenylethyl radicals additionally by C_1- to C_4-alkyl, or

R_3' and R_4', together with the nitrogen atom to which they are bonded, form an optionally C_1- to C_4-alkyl substituted pyrrolidine, morpholine, piperidine or piperazine ring,

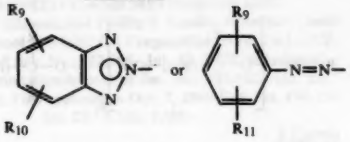
R_6 and R_7 independently of each other represent hydrogen, C_1- to C_4-alkyl, C_1- to C_4-alkoxy, fluorine, chlorine, bromine or NH-Ac,

Ac represents C_1- to C_4-alkylcarbonyl, -alkylsulphonyl or -alkylcarbamyl, benzoyl, toluoyl, phenylsulphonyl, phenylcarbamoyl, tolylsulphonyl, tolylcarbamyl or optionally substituted triazinyl,

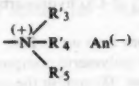
R^8 represents hydrogen, C_1- to C_4-alkyl, C_1- to C_4-alkoxy, chlorine, bromine, NH-Ac or a radical of the formula



-continued



R_9–R_{11} independently of one another represent hydrogen, C_1- to C_4-alkyl, C_1 to C_4-alkoxy, chlorine or bromine and R_{11} additionally represents.



Q represents O, S or NH and

Y represents a direct bond or a bridging link.

4,509,949

WATER THICKENING AGENTS CONSISTING OF COPOLYMERS OF CROSSLINKED ACRYLIC ACIDS AND ESTERS

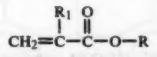
Chor Huang, Avon Lake, and Robert K. Schlatzer, Chagrin Falls, both of Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 13, 1983, Ser. No. 503,957

Int. Cl.[3] C08F 20/06; D06P 1/52

U.S. Cl. 586—558 7 Claims

1. Polymers of a monomeric mixture containing 95.9 to 98.8 weight percent of an olefinically unsaturated carboxylic monomer selected from the group consisting of acrylic, methacrylic and ethacrylic acids, about 1 to about 3.5 weight percent of an acrylate ester of the formula



wherein R is an alkyl radical containing 10 to 30 carbon atoms and R_1 is hydrogen, methyl or ethyl, and 0.1 to 0.6 weight percent of a polymerizable cross-linking polyalkenyl polyether of a polyhydric alcohol containing more than one alkenyl ether group per molecule wherein the parent polyhydric alcohol contains at least 3 carbon atoms and at least 3 hydroxyl groups.

4,509,950

EMULSIFYING AGENTS

Alan S. Baker, Slough, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Mar. 24, 1983, Ser. No. 478,550

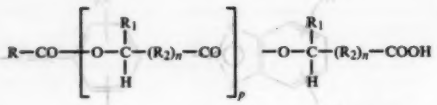
Int. Cl.[3] C10L 1/32

U.S. Cl. 44—51 16 Claims

1. A surfactant composition suitable for the emulsification of methanol or ethanol in a hydrocarbon liquid, the composition being a blend of:

(i) from 10% to 90% by weight of a block or graft copolymer having the general formula $(A—COO)_m—B$, wherein m is an integer at least 2, wherein each polymeric component A has a molecular weight of at least 500 and is the residue of an oil-soluble complex monocarboxylic acid having the general structural formula

(I)



in which

R is hydrogen or a monovalent hydrocarbon or substituted hydrocarbon group;

R_1 is hydrogen or a monovalent C_1 to C_{24} hydrocarbon group;

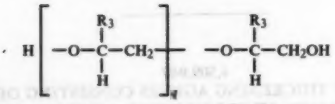
R_2 is a divalent C_1 to C_{24} hydrocarbon group;

n is zero or 1;

p is an integer from zero up to 200;

and wherein each polymeric component B has a molecular weight of at least 500 and, in the case where m is 2, is the divalent residue of a water-soluble polyalkylene glycol having the general formula

(II)



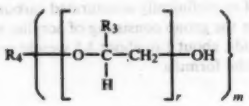
in which

R_3 is hydrogen or a C_1 to C_3 alkyl group;

q is an integer from 10 up to 500;

or in the case where m is greater than 2, is the residue of valency m of a water-soluble polyether polyol having the general formula

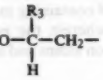
(III)



in which

R_3 and m have their previous significance;

r is zero or an integer from 1 to 500, provided that the total number of



units in the molecule is at least 10;

R_4 is the residue of an organic compound containing in the molecule m hydrogen atoms reactive with an alkylene oxide;

with (ii) from 90% to 10% by weight of a polyester which is the product of condensation of (a) a poly(isobutenyl)succinic acid of molecular weight in the range 500–5000, or anhydride thereof, with (b) a poly(alkylene glycol) of molecular weight in the range 400–4000 which is soluble in water to the extent of at least 5% by weight at 25° C.

12. An emulsion of methanol or ethanol in a liquid hydrocarbon fuel, the emulsion containing from 1% to 75% by weight of methanol or ethanol as the disperse phase, the methanol or ethanol containing at least 1% by weight of water, and from 25% to 99% by weight of the hydrocarbon fuel as the continuous phase, and in addition, an emulsifying agent; from 1% to 100% by weight, based on the disperse phase, of a surfactant as claimed in claim 1.

4,509,951

CORROSION INHIBITOR FOR ALCOHOL AND GASOHOL FUELS

Gordon G. Knapp, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 13, 1984, Ser. No. 619,976
Int. Cl.³ C10L 1/22
U.S. Cl. 44—53 **9 Claims**

1. A liquid fuel adapted for use in an internal combustion engine, said fuel consisting essentially of 5 to 100 weight percent of one or more alcohols, 0 to 95 weight percent gasoline and a corrosion inhibiting amount of a combination of (A) a polymer of one or more C_{16} to C_{18} polyunsaturated aliphatic monocarboxylic acids and (B) a polyisobutenyl succinimide of an alkylenepolyamine.

4,509,952

CHEMICAL COMPOSITION

Henry G. Braxton, Jr., Franklin, Mich., assignor to Ethyl Corporation, Richmond, Va.

Filed Apr. 1, 1981, Ser. No. 250,093
Int. Cl.³ C10L 1/22
U.S. Cl. 44—57 **3 Claims**

1. A fuel oil composition consisting essentially of a petroleum distillate fuel oil selected from the group consisting of furnace oil and diesel fuel and a minor amount of alkyldimethylamine, having the structure:

wherein R is a straight chain C_4–C_{20} alkyl or a mixture thereof, sufficient to stabilize said fuel oil against deterioration.

4,509,953

FUEL BLENDED WITH ALCOHOL FOR DIESEL ENGINE

Koichiro Itow, and Kunihiko Komiyama, both of Oyama, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed May 31, 1983, Ser. No. 499,478
Claims priority, application Japan, May 31, 1982, 57-92377
Int. Cl.³ C10L 1/08, 1/10
U.S. Cl. 44—57 **1 Claim**

1. A fuel for use in a diesel engine, which consisting essentially of:

(a) 70–90% by volume of a petroleum fuel selected from the group consisting of gas oil and heavy oil, said volume being based on the volume of petroleum fuel and ethyl alcohol;

(b) ethyl alcohol in an amount of 10–30% by volume based on the volume of petroleum fuel and ethyl alcohol; and

(c) gasoline as a mutual solvent for said petroleum fuel and ethyl alcohol in an amount up to 30% by volume based on the total volume of the fuel, said gasoline being present in an amount sufficient to maintain the fuel in a single phase solution.

4,509,954

METHOD FOR IMPROVING COLD FLOW OF FUEL OILS

Takaharu Ishizaki, Nishinomiya; Tsuneo Kimura, Kitasoma, and Shingo Yamazaki, Amagasaki, all of Japan, assignors to Nippon Oil and Fats Company, Ltd., Tokyo, Japan

Filed Feb. 1, 1984, Ser. No. 575,797
Claims priority, application Japan, Feb. 16, 1983, 58-22904
Int. Cl.³ C10L 1/22
U.S. Cl. 44—62 **8 Claims**

1. A method for improving the cold flow of fuel oils which

comprises, adding to fuel oils, esters of (a) an addition product of an epoxide selected from the group consisting of alkylene oxide, styrene oxide and glycidol and compounds having the formula (1),

(1)

wherein R_1, R_2, and R_3 are selected from the group consisting of H—, $CH_3(CH_2)_n$—, $CH_3(CH_2)_nCO$—, $—CH_2CH_2OH$, $—CH(CH_3)CH_2OH$ and $—CH_2CH(OH)CH_2OH$, wherein n represents a number from 0 to 25 and at least one of R_1, R_2 and R_3 is selected from the group consisting of $—CH_2CH_2OH$, $—CH(CH_3)CH_2OH$ and $—CH_2CH(OH)CH_2OH$; and, (b) linear saturated fatty acids.

4,509,955

COMBINATIONS OF CARBOXYLIC ACYLATING AGENTS SUBSTITUTED WITH OLEFIN POLYMERS OF HIGH AND LOW MOLECULAR WEIGHT MONO-OLEFINS, DERIVATIVES THEREOF, AND FUELS AND LUBRICANTS CONTAINING SAME

Katsumi Hayashi, Mentor, Ohio, assignor to The Lubrizol Corporation, Ohio

Division of Ser. No. 404,848, Aug. 9, 1982, Pat. No. 4,471,091. This application Jun. 21, 1984, Ser. No. 623,270

Int. Cl.³ C10L *1/22*

U.S. Cl. 44—62 **32 Claims**

1. A concentrate comprising a normally liquid diluent and about 20% to about 90% by weight of a composition comprising

(A) the reaction product of

(A)(1) one or more alpha-beta olefinically unsaturated carboxylic acid reagents containing 2 to about 20 carbon atoms exclusive of the carboxyl-based groups, with

(A)(2) one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of homopolymers and/or interpolymers of mono-olefins of from 12 to 30 carbon atoms, and chlorinated or brominated analogs thereof; and

(B) the reaction product of

(B)(1) one or more alpha-beta olefinically unsaturated carboxylic acid reagents containing 2 to about 20 carbon atoms exclusive of the carboxyl-based groups, with

(B)(2) one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of homopolymers and/or interpolymers of mono-1-olefins of from 2 to 8 carbon atoms and chlorinated or brominated analogs thereof.

17. A fuel composition comprising a major amount of a normally liquid fuel and a minor amount of a composition comprising

(A) the reaction product of

(A)(1) one or more alpha-beta olefinically unsaturated carboxylic acid reagents containing 2 to about 20 carbon atoms exclusive of the carboxyl-based groups, with

(A)(2) one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of homopolymers and/or interpolymers of mono-olefins of from 12 to 30 carbon atoms, and chlorinated or brominated analogs thereof; and

(B) the reaction product of

(B)(1) one or more alpha-beta olefinically unsaturated carboxylic acid reagents containing 2 to about 20 carbon atoms exclusive of the carboxyl-based groups, with

(B)(2) one or more olefin polymers of at least 30 carbon atoms selected from the group consisting of homopolymers and/or interpolymers of mono-1-olefins of from 2 to 8 carbon atoms and chlorinated or brominated analogs thereof.

4,509,956

FUEL ADDITIVE AND METHOD OF USE

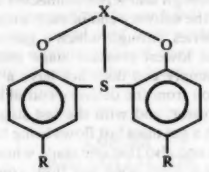
Milton Braid, Westmont, and Phillip S. Landis, Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 922,906, Jul. 10, 1978, abandoned, which is a continuation-in-part of Ser. No. 899,682, Apr. 24, 1978, abandoned. This application Oct. 7, 1980, Ser. No. 194,738

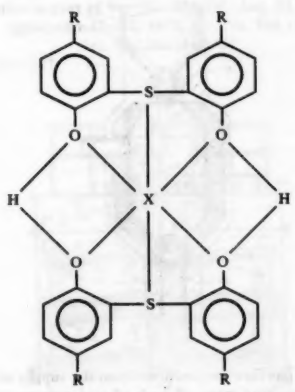
Int. Cl.³ C10L *1/30*

U.S. Cl. 44—68 **9 Claims**

1. The method of substantially reducing the formation of undesirable noxious nitrogen oxide compounds and particulate emissions in internal combustion engines comprising intimately admixing with the hydrocarbon base fuel used therein a minor effective amount of a thiobis (alkylphenolate) and/or a thiobis (alkylphenolphenolate) having the following general structures:



and



where R is hydrogen or an alkyl group having from 1 to about 30 carbon atoms and X is copper and wherein the hydrocarbon base fuel is selected from hydrocarbon fractions having an initial boiling point of at least about 75° to 100° F. and an end boiling point no higher than about 750° F. and boiling substantially continuously throughout their distillation range and wherein said hydrocarbon base fuel is a gasoline; a diesel fuel or a gas turbine fuel.

4,509,957

CYCLIC CHAR GASIFIER

Joseph C. Firey, P.O. Box 15514, Seattle, Wash. 98115

Continuation-in-part of Ser. No. 328,148, Dec. 7, 1981, abandoned, which is a continuation of Ser. No. 121,973, Feb. 15, 1980, abandoned. This application Nov. 16, 1983, Ser. No. 552,398

Int. Cl.³ C10J *3/00, 3/22, 3/30*

U.S. Cl. 48—61 **37 Claims**

1. A machine for gasifying char fuels comprising at least one cyclic char gasifier plant comprising:

at least one compressor means for compressing gases from a lower pressure to a higher pressure and each such com-

pressor comprising at least one stage and each such stage comprising a supply end and a delivery end;

means for driving each of said compressors;

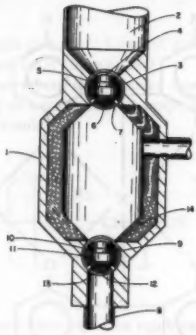
at least one expander means for expanding gas from a higher pressure to a lower pressure and each such expander comprising at least one stage and each such stage comprising an inlet end and a discharge end;

at least two separate containers for containing char fuel;

at least one product gas collector pipe;

at least one reactant gas supply source;

each such compressor whose number of stages exceeds one further comprising fixed open gas flow connections from the delivery end of each compressor stage, except one, to the supply end of one other stage of said compressor, whereby said stages of said compressor are connected in series so that the pressure of a particular gas mass, at delivery from each stage, increases as said gas mass is compressed through said series connected stages, from the supply end to the delivery end of each stage, with the first stage in said series through which a gas mass first flows being both the lowest pressure stage and also that one stage whose supply end does not have a fixed open gas flow connection from the delivery end of any other stage or said compressor, and with the last stage in said series through which a gas mass last flows being both the highest pressure stage and also that one stage whose delivery end does not have a fixed open gas flow connection to the supply end of any other stage of said compressor;



fixed open gas flow connections from the supply end of the lowest pressure stage of each of said compressors to at least one reactant gas supply source;

each such expander whose number of stages exceeds one further comprising fixed open gas flow connections from the discharge end of each expander stage, except one, to the inlet end of one other stage of said expander, whereby said stages of said expander are connected in series so that the pressure of a particular gas mass at discharge from each stage, decreases as said gas mass is expanded through said series connected stages, from the inlet end to the discharge end of each stage, with the first stage in said series through which a gas mass first flows being both the highest pressure stage and also that one stage whose inlet end does not have a fixed open gas flow connection from the discharge end of any other stage of said expander, and with the last stage in said series through which a gas mass last flows being both the lowest pressure stage and also that one stage whose discharge end does not have a fixed open gas flow connection to the inlet end of any other stage of said expander;

fixed open gas flow connections from the discharge end of the lowest pressure stage of each of said expanders to a separate product gas collector pipe;

changeable flow connections, which are openable and closeable, from each of said containers to each delivery end of each stage of each of said compressors and to each inlet end of each stage of each of said expanders;

each cyclic char gasifier plant comprising a number of said containers, with changeable gas flow connections to said compressors and to said expanders, at least equal to the sum of the number of compressor stages of all compressors and the number of expander stages of all expanders;

means for opening and closing said changeable gas flow connections so that, each container is opened for a time period to each delivery end of each stage of each of said compressors, in a sub-sequence of time periods of open gas flow connections to compressors, said sub-sequence proceeding in time order of increasing compressor stage delivery pressure, and is opened for a time period to each inlet end of each stage of said expanders, in a sub-sequence of time periods of open gas flow connections to expanders, said sub-sequence proceeding in time order of decreasing expander stage inlet pressure, said sub-sequence of connections to said compressor being followed by said sub-sequence of connections to said expanders, and these together comprise one sequence of time periods of open gas flow connections, each of said containers is opened to only one stage during any one time period of said sequence of time periods, said sequence of time periods of open gas flow connections to said compressors and to said expanders is repeated for each of said containers by said means for opening and closing;

means for controlling said means for opening and closing so that said repeated sequences of time periods of open gas flow connections are a continuous series of time periods for any one containing means, and so that the delivery end of each stage of each compressor has an open gas flow connection to at least one containing means, and the inlet end of each stage of each expander has an open gas flow connection to at least one containing means, during all time periods, whenever said plant is operating.

4,509,958

HIGH-EFFICIENCY ELECTROSTATIC FILTER DEVICE

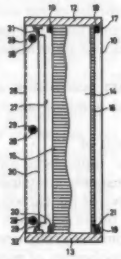
Senichi Masuda, 605, 40-10, Nishigahara 1-chome, Kita-ku, Tokyo, and Naoki Sugita, Kawaguchi, both of Japan, assignors to Senichi Masuda, Tokyo, Japan

Filed Oct. 8, 1982, Ser. No. 433,414

Claims priority, application Japan, Oct. 12, 1981, 56-162383; Dec. 28, 1981, 56-214150

Int. Cl.³ B03C *3/00*

U.S. Cl. 55—132 **12 Claims**



1. A high-efficiency electrostatic filter device comprising a charging section where the dust particles in a dust-laden gas passed therethrough are electrically charged by corona discharge, and a dust collecting section comprising a filter medium arranged meandering in the direction orthogonal to the direction of flow of the dust-laden gas emerging from said charging section and a first set of a plurality of upstream generally parallel separator electrodes on the upstream side of the filter medium and a second set of a plurality of downstream generally parallel separator electrodes on the downstream side

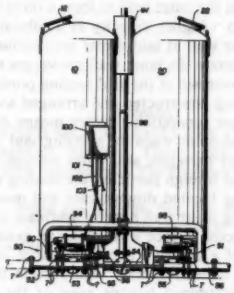
of the filter medium, the upstream and downstream separator electrodes being arranged to allow passage of the dust-laden gas in the spaces between every adjoining parts of said meandering filter medium from both the upstream side and the downstream side of said gas stream, first and second elongated electroconductive resistance elements electrically connecting the first and second sets of separator electrodes respectively, each said elongated resistance element being in contact with and electrically connecting the separator electrodes of the respective set of electrodes with electrical resistance between separator electrodes, a high voltage power source applied between said upstream separator electrodes and downstream separator electrodes via the electroconductive resistance elements, the electroconductive resistance elements having said electrical resistance between separator electrodes for preventing dissipation of the separator electrode charges by resisting movement of charges between said separator electrodes upon the occurrence of an electric discharge from one of the separator electrodes.

4,509,959

MODULAR INDUSTRIAL OXYGEN CONCENTRATOR

Norman R. McCombs, Tonawanda, N.Y., assignor to Greene & Kellogg, Inc., Tonawanda, N.Y.

Filed Jul. 28, 1983, Ser. No. 517,896
Int. Cl.³ B01D *53/04*
U.S. Cl. 55—161 **22 Claims**



1. A modular pressure swing tonnage absorption apparatus for separating mixtures of gases into component parts, said apparatus being made substantially entirely of a plurality of pre-fabricated modules comprising;

a first module including at least one gas absorption means for effecting the gas separation;

a second module including a surge tank for collecting one component gas separated out of said gas mixture by said first module;

a third module including means for delivering the gas mixture to said first module and for conducting waste gas away from said first module;

a fourth module including means for transferring said one component gas away from said first module to said second module, and for directing gas to said first module for purging said first module;

electrically operated control means associated with at least one of said first through fourth modules;

means for pneumatically, electrically and mechanically interconnecting said first, second, third and fourth modules and said electrically operated control means, whereby said apparatus may be moved as individual modules to or from a site for PSA use, and assembled on-site by mechanically, pneumatically and electrically interconnecting said components, to thereby produce a relatively large such unit adapted to produce relatively large quantities said one component gas;

said means mechanically interconnecting said modules comprising flange means, and

said first, second, third and fourth modules being of dimensions sufficient to handle large enough quantities of said mixtures of gases to produce said large quantities of said one component of said gas on the order of tons per day of said one component gas.

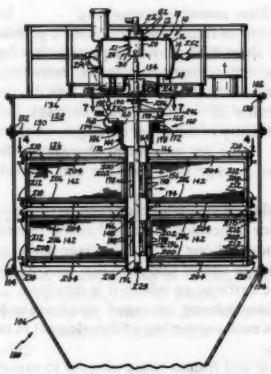
22. A relatively large capacity PSA machine adapted to be built up on-site of a plurality of preassembled modules, said modules comprising a gas absorption means module comprising at least one pressure vessel, a feed/waste gas manifold and valve assembly module, a purge/product gas manifold and valve assembly module, and a surge tank means module, electrically operated control means for the valves in said feed/waste and said purge/product manifold modules, means to permit relatively fast and simple on-site mechanical, pneumatic and electrical assembly of said modules and control means into said PSA machine; said means to permit assembly comprising flange means interconnecting the gas handling portions of said at least one pressure vessel, said feed/waste gas module, said purge/product gas module, and said surge tank means module; and said capacity of said machine being on the order of tons per day of product gas.

4,509,960

DUST COLLECTOR

Mark R. Engel, Apple Valley, Minn., assignor to Donaldson Company, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 522,348, Aug. 11, 1983,. This application Oct. 7, 1983, Ser. No. 540,121
Int. Cl.³ B01D *46/04*
U.S. Cl. 55—287 **6 Claims**



1. Dust collector apparatus, comprising:

a housing divided into inlet and clean gas chambers, said chambers being separated by a partition, said inlet chamber having an inlet port and said clean chamber having an outlet port, said housing having a top;

a clean gas drum hung vertically from said partition, said drum having an interior in fluid communication with said clean gas chamber, said drum having a bottom;

a plurality of filter elements attached to and in flow communication with said drum, the gas cleaned by each of said filter elements flowing into the interior of said drum and continuing to said clean gas chamber; and

means for producing a reverse gas pulse to clean said elements, said reverse gas pulse producing means including:

a gas pressure source including means for creating a gas pulse;

a blow pipe having an opening alignable with an end of each of said filter elements in flow communication with said drum for directing the gas pulse therein;

means for providing fluid communication between said blow pipe and said pulse creating means; and

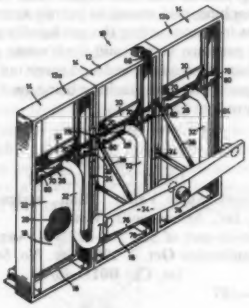
means for rotating said blow pipe with respect to said clean gas drum, said rotating means including first means for bearing said blow pipe at the bottom of said drum and second means for bearing said blow pipe at the top of said housing.

4,509,961

AIR FILTER ASSEMBLY

William H. Jones, Toronto, Canada, assignor to Armstrong Jones Inc., Toronto, Canada

Filed Jun. 17, 1983, Ser. No. 505,381
Int. Cl.³ B01D *35/16*
U.S. Cl. 55—294 **1 Claim**



1. An air filter assembly comprising

(a) a plurality of frames each defining a perimeter of a rectangular shaped air filtration passage having a minor dimension and a major dimension, each frame having an upstream side and a downstream side,

(b) a plurality of carriages, one carriage being mounted, independently of the other carriages, on the upstream side of each frame for movement therealong to traverse the filtration passage between first and second ends of the frame,

(c) a plurality of vacuum heads each having a width equal to the minor dimension of said filtration passage, said heads being mounted one on each carriage and extending across the width of one of said filtration passages for movement with the carriage on which it is mounted,

(d) said frames being arranged side-by-side to form filter modules each supporting a filter element in its air filtration passage,

(e) a first of said frames being adapted to suport a stationary vacuum manifold at the upstream side thereof and flexible conduit means connecting said vacuum manifold to each of said vacuum heads,

(f) a plurality of flexible conduits, one end of each conduit connecting with the stationary vacuum manifold and the other ends being connected one to each vacuum head,

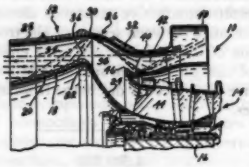
(g) a powered drive unit mounted on said first frame at the downstream side of said first frame, which means mounted at the downstream side of each of said frames, said powered drive means being releasably connected to the winch means of each frame, first and second power transmission cables extending from each winch through the first and second ends of its associated frame, respectively, and being connected to the carriage which is mounted on said associated frame such that, upon take-up of said first cable, its associated carriage is driven to said first end of its associated frame and upon take-up of the second cable, the carriage is driven to the second end of the associated frame to cause the carriage and vacuum head to traverse substantially the entire upstream end of its associated filter passage.

4,509,962

INERTIAL PARTICLE SEPARATOR

Daniel S. Breitman, Oakville, Canada, and Henrique Langenegger, Rio de Janeiro, Brazil, assignors to Pratt & Whitney Canada Inc., Lonqueuil, Canada

Filed Oct. 6, 1983, Ser. No. 539,748
Int. Cl.³ B01D *45/16*
U.S. Cl. 55—306 **6 Claims**



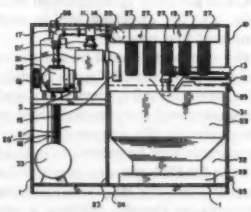
1. An airflow particle separator having an axis, the particle separator being provided for removing foreign particles and moisture from the air flow, said separator comprising an inner wall and an outer wall defining a passageway therebetween, said inner wall including an inner wall portion diverging in a downstream direction away from the separator axis while converging towards the outer wall to form a throat to accelerate incoming air to a higher velocity in a substantially axial direction; said inner wall at said throat area including a flow turning portion wherein the inner wall converges towards the separator axis downstream of the said turning portion and said turning portion being constructed and arranged so as to minimize boundary layer separation; splitter means disposed between the inner and outer walls for splitting said passageway into inner and outer passages, said outer passage adapted to bypass moisture and foreign particles, the leading edge of the splitter means being located downstream and inward of said throat; the diverging inner wall portion upstream of the throat area having a deflector surface and having an axial configuration in the form of a concave parabolic curve such that as particles strike the deflecting inner wall portion they will be focused in a predetermined bounce zone of the outer wall adjacent and downstream of the throat such that the particles will be bounced on top of and downstream of the splitter means into the outer passage.

4,509,963

INDUSTRIAL VACUUM CLEANER

Carroll V. Jackson, Northbrook, Ill., assignor to Wm. W. Meyer & Sons, Inc., Skokie, Ill.

Continuation-in-part of Ser. No. 364,423, Apr. 1, 1982, abandoned. This application Jan. 16, 1984, Ser. No. 570,753
Int. Cl.³ B01D *50/00*
U.S. Cl. 55—324 **12 Claims**



1. An industrial vacuum cleaner comprising a housing hav-

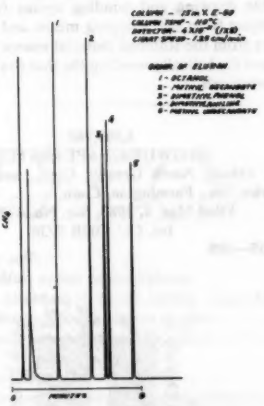
ing vacuum operated material intake means, a sealed vacuum chamber communicating with said intake means, said vacuum chamber having an upper and a lower portion, filter means for filtering matter operating in conjunction with blower intake means for generating vacuum in said vacuum chamber, and operative to draw material through said filter means, said blower intake means having an outlet for exhausting the airflow outwardly of the vacuum chamber coupled between said filter means and said blower intake means, means for channelling said airflow through said filter means, a partition being located within said housing and defining said vacuum chamber on one side thereof and the machinery chamber on the other side, and said blower being located within said machinery chamber, and isolated from said vacuum chamber and being in fluid communication with the vacuum chamber via said filter means, the improvement comprising; removable waste collection means disposed in the lower portion of said vacuum chamber, below said filter means for receiving the material drawn into the chamber through the intake means, the sealed vacuum chamber constituting an integral permanent component of said housing, said sealed vacuum chamber having sealing access means of larger dimensions than said waste collection means thereby permitting the removal of said waste collection means, said waste collection means being removably mounted in said vacuum chamber.

4,509,964

FUSED SILICA CAPILLARY COLUMN

John A. Hubball, Meriden, Conn., and Eugene F. Barry, Nashua, N.H., assignors to The Foxboro Company, Foxboro, Mass.

Filed Jan. 4, 1984, Ser. No. 568,074
Int. Cl.³ B01D *15/08*
U.S. Cl. 55—386 **10 Claims**



8. A chromatographic capillary column of fused silica prepared by a process comprising the steps of:

irradiating fused silica capillary tubing with gamma radiation while said fused silica is in a raw state, free of any coating; and thereafter

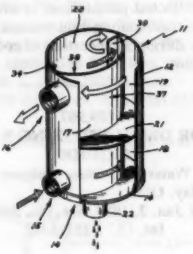
applying a polar stationary phase coating to the inner wall of said tubing to form the chromatographic column.

4,509,965

WATER-STEAM SEPARATOR

Willard Morton, 12272 17th Ave., South, Burnsville, Minn. 55337

Filed Feb. 14, 1983, Ser. No. 466,053
Int. Cl.³ B01D *45/16*
U.S. Cl. 55—399 **6 Claims**



1. A water-steam separator comprising:

(a) a body having a top end and a bottom end;

(b) a drain means in the body;

(c) an inlet means in the body;

(d) an outlet means in the body;

(e) a flow diverter in the body and positioned and arranged with respect to the inlet and outlet means and the drain means so as to divide the body into a condensate area having the drain means within the condensate area and an inlet-outlet area, the flow diverter extending substantially from the top end of the body to the bottom end of the body; and

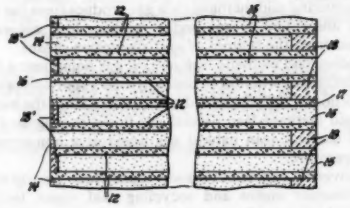
(f) a partition positioned inside the inlet-outlet area and positioned with respect to the diverter so as to divide the inlet-outlet area into a separate outlet area and a separate inlet area such that vapor entering through the inlet means is forced to travel first through the inlet area, then into the condensate area, and finally through the outlet area to the outlet means.

4,509,966

WALL-FLOW MONOLITH FILTER WITH POROUS PLUGS

David L. Dimick, Birmingham; Kenneth B. Bly, Pontiac, and Otto A. Ludecke, Rochester, all of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed May 18, 1983, Ser. No. 495,579
Int. Cl.³ B01D *39/20*
U.S. Cl. 55—502 **4 Claims**



1. In a through flow exhaust particulate filter element of the type including a ceramic monolith structure having a plurality of thin interlaced gas filtering porous internal walls defining a plurality of parallel passages extending to opposite inlet and outlet ends thereof, said passages including a first group comprising inlet passages open at said inlet end of the element and

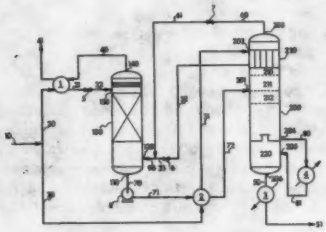
closed by plugs at the outlet end and a second group comprising outlet passages closed by plugs at said inlet end and open at said outlet end; the improvement wherein at least said plugs of said outlet passages at said inlet end of said element are of a ceramic porous material corresponding in porosity and thickness substantially to that of said porous internal walls whereby said plugs are permeable for exhaust gas flow therethrough so that particulates will also be trapped by said porous plugs to create paths of collected particulates in order to thus permit more rapid flame travel along said porous plugs to adjacent said inlet passages during incineration of collected particulates on the filter element.

4,509,967

PROCESS FOR DEVOLATILIZING NATURAL GAS LIQUIDS

Welby C. Sweet, Waterville, Ohio, assignor to Marathon Oil Company, Findlay, Ohio

Filed Jan. 3, 1984, Ser. No. 567,716
Int. Cl.³ F25J 3/02
U.S. Cl. 62—17 **16 Claims**



1. A process comprising:

retrofitting an existing natural gas separation process to obtain a retrofitted process for separating a natural gas feed selected from a broad range of compositions into a methane-rich gas product and a partially deethanized natural gas liquid product, said retrofitted process including the steps of:

(a) dividing said natural gas feed into a first stream and a second stream, the two streams having the same composition;

(b) reducing the temperature and pressure of said first and second streams such that each said stream has a distinct liquid phase and a distinct gas phase, said first stream has a temperature substantially lower than said second stream, and at least said first stream has a cryogenic temperature;

(c) feeding said first stream into the upper portion of a demethanizing absorption means and said second stream into the lower portion of said absorption means;

(d) recovering said methane-rich gas product from the top of said absorption means and a methane-lean natural gas liquid from the bottom of said absorption means;

(e) feeding said methane-lean natural gas liquid into a deethanizer means wherein an uncondensed vapor comprised of a portion of the ethane and substantially all of the methane in said methane-lean natural gas liquid is separated from said methane-lean natural gas liquid at a non-cryogenic temperature;

(f) recovering said uncondensed vapor from the top of said deethanizer means and recycling said vapor into said second stream of step (c) prior to feeding said second stream into said absorption means; and

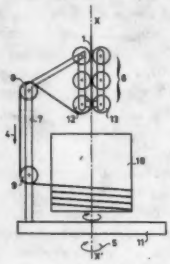
(g) recovering said partially deethanized natural gas liquid product from the bottom of said deethanizer means comprised of the remaining portion of ethane and heavier hydrocarbons in said methane-lean natural gas liquid and which is less volatile than said methane-lean natural gas liquid.

4,509,968

DEVICE FOR PROVIDING A DRAWN FIBER-LIKE OBJECT WITH A HELICAL STRUCTURE

Hervé Arditty; Yannic Bourbin; Jacques Dubos; Francis Gautnier, and Philippe Graindorge, all of Paris, France, assignors to Thomson - CSF, France

Filed Sep. 27, 1982, Ser. No. 424,293
Claims priority, application France, Nov. 3, 1981, 81 20595
Int. Cl.³ C03B 37/03
U.S. Cl. 65—13.1 **12 Claims**



1. A device for providing a drawn fiber-like object with a helical structure, said device comprising:

means for providing a softened material source to be drawn into said object;

a disk supported for rotational movement about a drawing axis for the drawing of said object;

guiding means fixed and supported via a gantry which is fixed to said disk for guiding and passing the drawn object from a softened material source;

gripping means for receiving said drawn object from said guiding means and gripping a solidified portion of the drawn object, said gripping means being supported by said gantry fixed to said disk for rotational movement around said drawing axis whereby rotation of said disk responsively subjects the drawn object to torsion in order to leave a residual stress state after hardening of the drawn object; and

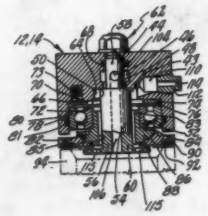
rotatable drawing and winding means for receiving said drawn object from said gripping means and thereby drawing the object from the softened material source along said drawing axis and for helically winding the thus drawn object around said drawing axis.

4,509,969

BLOWHEAD APPARATUS

Vaughan Abbott, North Granby, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Mar. 4, 1983, Ser. No. 472,361
Int. Cl.³ C03B 9/36
U.S. Cl. 65—300 **4 Claims**



1. A blowhead in a glassware forming machine comprising a blowhead body, at least one cavity in said body, a retaining

member secured in the cavity and extending therefrom, said retaining member having a body portion and a flange at the end of the body portion outside of said cavity, a seating member having a bore surrounding said body portion, the wall of said bore being spaced from said body portion, a sealed bearing having an inner and outer race, said inner race being sealingly secured to said seating member and said outer race having sliding engagement with the wall of said cavity, sealing means between said outer race and the wall of said cavity, said seating member having a seating surface, a sealing ring having a seating surface mating with said seating surface on said seating member, and means biasing said bearing, sealing member and sealing ring toward said flange.

4,509,970

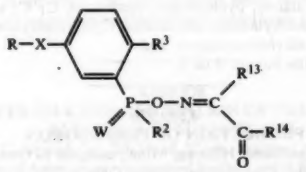
SUBSTITUTED PHENYLPHOSPHINYLOXY- AND PHOSPHINYLTHIO-IMINOCARBOXYLATES USEFUL FOR THE CONTROL OF WEEDS

Shy-Fuh Lee, Sunnyvale, Calif., assignor to Zoecon Corporation, Palo Alto, Calif.

Filed Dec. 17, 1981, Ser. No. 331,496
Int. Cl.³ A01N *57/00*
U.S. Cl. 71—86 **12 Claims**

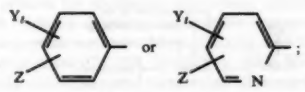
1. A compound of the formula:

(A)



wherein,

R is the group



W is oxygen or sulfur;

X is oxygen, sulfur, amino or methylene;

Y is hydrogen, lower alkyl, lower alkoxy, lower haloalkyl, lower haloalkoxy, halogen, cyano or nitro;

Z is independently selected from the values of Y; t is zero, one or two:

R^2 is hydrogen, lower alkyl or phenyl;

R^3 is cyano, nitro, nitroso, amino, hydroxyamino or chloro:

R^{13} is hydrogen, lower alkyl, lower cycloalkyl, phenyl, substituted phenyl, furyl or thienyl; and

R^{14} is OH, O^-Na^+, lower alkyl, lower alkoxy, lower alkylthio, phenyl, substituted phenyl, phenoxy, phenylthio or benzyloxy.

11. A method for the control of weeds which comprises treating said weed or its locus with a herbicidally effective amount of a compound of formula (A) as defined in claim **1**.

4,509,971

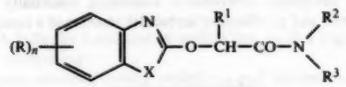
BENZOTHIAZOLE SUBSTITUTED CARBOXYLIC ACID AMIDE COMPOUNDS AND HERBICIDAL METHODS COMPOSITIONS THEREOF

Heinz Förster; Wolfgang Hofer; Volker Mues, all of Wuppertal; Ludwig Eue, Leverkusen, and Robert R. Schmidt, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 270,039, Jun. 3, 1981, abandoned, which is a continuation of Ser. No. 35,361, May 2, 1979, abandoned. This application Aug. 19, 1983, Ser. No. 524,698
Claims priority, application Fed. Rep. of Germany, May 20, 1978, 2822155; Feb. 2, 1979, 2903966
Int. Cl.³ A01N *43/78, 43/90*; C07D *417/12, 277/68*
U.S. Cl. 71—90 **27 Claims**

1. Substituted carboxylic acid amide compound of the formula

(I)



wherein

n is 1 or 2;

each R is independently selected from hydrogen, halogen, trifluoromethyl, alkoxy with 1 to 2 carbon atoms, and trifluoromethoxy, and two R substituents taken together can form difluoromethylenedioxy;

R^1 is hydrogen;

R^2 and R^3 are individually selected from alkyl with 1 to 18 carbon atoms, allyl, alkynyl with 3 to 5 carbon atoms, phenylalkyl with 1 to 2 carbon atoms in the alkyl part, cyanoethyl, alkoxyalkyl with 2 to 3 carbon atoms, cyclohexyl, and aryl with 6 or 10 carbon atoms, or R^2 and R^3 together with the nitrogen atom to which they are bonded, form a pyrrolidinyl, piperidinyl, perhydroazepinyl or dodecamethyleneimino radical, which is optionally substituted by 1 to 3 alkyl groups with 1 to 2 carbon atoms per alkyl group; and

X is sulfur.

23. Method of combating weeds which method comprises applying to such weeds or their habitat a herbicidally effective amount of a substituted carboxylic acid amide compound as claimed in claim **1**.

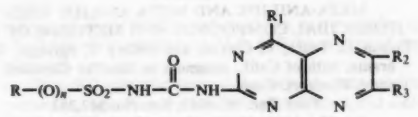
4,509,972

N-PTERIDINYL-UREAS

Rudolf Mengel; Ludwig Schröder, both of Ingelheim; Werner Stransky, Gau-Algesheim; Gerbert Linden, Ingelheim; Gerhart Schneider, Mühltal, and Sigmund Lust, Darmstadt, all of Fed. Rep. of Germany, assignors to Celamerck GmbH & Co. KG, Ingelheim am Rhein, Fed. Rep. of Germany

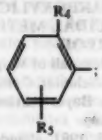
Filed Mar. 28, 1983, Ser. No. 479,708
Claims priority, application Fed. Rep. of Germany, Apr. 10, 1982, 3213507; May 21, 1982, 3219145; Jul. 28, 1982, 3228100
Int. Cl.³ A01N *43/90*; C07D *475/04, 475/08*
U.S. Cl. 71—92 **9 Claims**

1. A compound of the formula



wherein

R is 2,2,2-trichloroethyl or



R_1 is methoxy, amino, mono(alkyl of 1 to 2 carbon atoms)-amino or di(alkyl of 1 to 2 carbon atoms)-amino;

R_2 and R_3 are each independently hydrogen or methyl;

R_4 is halogen, methoxy, trifluoromethyl, lower alkoxy-carbonyl or dimethylcarbamoyl;

R_5 is hydrogen, lower alkyl, lower alkoxy or halogen; and n is 0 or 1;

or a salt thereof.

4. An herbicidal composition consisting essentially of an inert carrier and an effective herbicidal amount of a compound of claim 1.

4,509,973

PLANT GROWTH REGULATING COMPOSITIONS

Cyril Kust, Pennington, and Prithvi Bhalla, Hightstown, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 13, 1984, Ser. No. 570,568
Int. Cl.³ D01N *43/50*
U.S. Cl. 71—92 **8 Claims**

1. A plant growth regulating composition for use on a crop, said composition comprising: (2-chloroethyl)trimethylammonium chloride and 2-(4-isopropyl-4-methyl(5-oxo-2-imidazolin-2-yl) 3-quinolinecarboxylic acid, as the active ingredients; wherein said (2-chloroethyl)trimethylammonium chloride and said 2-(4-isopropyl-4-methyl(5-oxo-2-imidazolin-2-yl) 3-quinolinecarboxylic acid are present in the ratio of about 3220:1 to 230:1 as provided to said crop.

4,509,974

S-N-BUTYL-N,N-DIISOPROPYL THIOCARBAMATE AS A SELECTIVE HERBICIDE IN COTTON

Reed A. Gray, Saratoga, and Grant K. Joo, Cupertino, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 4, 1982, Ser. No. 432,468
Int. Cl.³ A01N *37/00*; C07C *155/02*
U.S. Cl. 71—100 **3 Claims**

1. A method of selectively controlling undesirable vegetation in cotton comprising applying an herbicidally effective amount of S-n-butyl-N,N-diisopropylthiocarbamate.

2. S-n-butyl N,N-diisopropyl thiocarbamate.

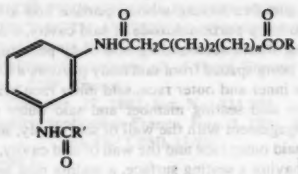
4,509,975

META-ANILIDE AND META-ANILIDE UREA HERBICIDAL COMPOUNDS AND METHODS OF USE

Eugene G. Teach, El Cerrito, and Jeffery T. Springer, El Sobrante, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 30, 1983, Ser. No. 567,283
Int. Cl.³ A01N *37/00, 37/44, 47/30*; C07C *155/02*
U.S. Cl. 71—100 **25 Claims**

1. A compound having the structural formula



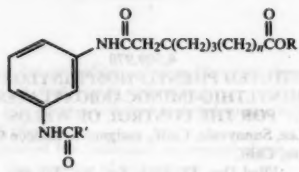
wherein

R is selected from the group consisting of C_1–C_5 alkyl, C_1–C_3 haloalkyl, phenyl and C_2–C_8 alkoxyalkyl;

R′ is selected from the group consisting of C_2–C_8 alkyl, C_1–C_3 alkoxy, cyclopropyl, methacryl, C_1–C_3 alkylmercapto, methylamino, ethylamino, C_2–C_4 dialkylamino, and C_2–C_4 alkylalkoxyamino; and

n equals the integer 0 or 1.

14. The method of controlling undesirable vegetation comprising applying to the area where control is desired, an herbicidally effective amount of a compound having the formula



wherein

R is selected from the group consisting of C_1–C_5 alkyl, C_1–C_3 haloalkyl, phenyl and C_2–C_8 alkoxyalkyl;

R′ is selected from the group consisting of C_2–C_8 alkyl, C_1–C_3 alkoxy, cyclopropyl, methacryl, C_1–C_3 alkylmercapto, methylamino, ethylamino, C_2–C_4 dialkylamino, and C_2–C_4 alkylalkoxyamino; and

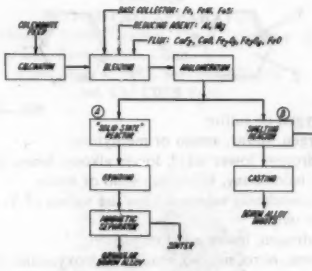
n equals the integer 0 or 1.

4,509,976

PRODUCTION OF FERROBORON

Adolfo R. Zambrano, Hibbing, Minn., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Mar. 22, 1984, Ser. No. 592,134
Int. Cl.³ C22C *33/00*
U.S. Cl. 75—21 **20 Claims**



1. A process for producing ferroboron including the step of reducing borate compounds with a material selected from the group consisting of uncombined aluminum, aluminum oxide, uncombined magnesium, and magnesium oxide in the presence of iron under an inert atmosphere at temperatures below the fusion temperature of slag forming constituents.

4,509,977

PROCESS AND DEVICE FOR SCAVENGING A METAL MELT, IN PARTICULAR STEEL, IN A CASTING LADLE OR THE LIKE PROVIDED WITH A PLUG CLOSURE

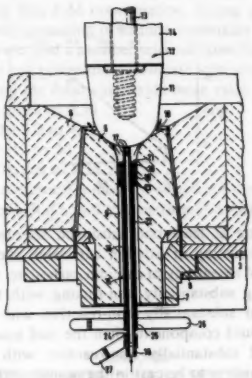
Hans Geber, Unkel, Fed. Rep. of Germany, assignor to Messer Griesheim GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 22, 1984, Ser. No. 592,219

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1983, 3311617

Int. Cl.³ C21C 7/00

U.S. Cl. 75—59 18 Claims



1. In a process for scavenging a metal melt especially of steel in a casting ladle or the like, which has an outlet at the bottom with a plug closing from the inside of the ladle whereby the scavenging gas is introduced in the melting bath through the bottom of the ladle, the improvement being in that the scavenging gas is introduced through the outlet with the plug in its closing position.

4,509,978

RECOVERABLE IMMOBILIZATION OF TRANSURANIC ELEMENTS IN SULFATE ASH

Wilbur O. Greenhalgh, Richland, Wash., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Dec. 7, 1982, Ser. No. 447,569

Int. Cl.³ C22B 60/02

U.S. Cl. 75—84.1 R 6 Claims

1. In a process for reclaiming transuranic elements from a sulfate ash made by digesting combustible wastes in sulfuric acid, an improved method of immobilizing said transuranic elements in a physically and chemically stable form, and of subsequently recovering said transuranic elements therefrom, comprising:

(1) adding to said ash metal selected from the group consisting of aluminum, cerium, samarium, europium, and mixtures thereof, in an amount sufficient to form alloys with said transuranic elements plus an additional amount sufficient to reduce said transuranic elements to elemental form;

(2) adding to said ash sufficient fluxing agent to lower the weight percentage of said transuranic element sulfates to about 1 to about 10%;

(3) heating the mixture of said ash, metal, and fluxing agent to a temperature sufficient to melt said fluxing agent and said metal;

(4) cooling said mixture to a solid;

(5) separating said alloys from the remainder of said mixture; and

(6) dissolving said alloy in a solution comprising nitric acid.

4,509,979

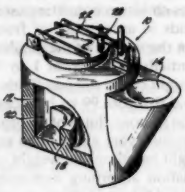
METHOD AND APPARATUS FOR THE TREATMENT OF IRON WITH A REACTANT

Gerd F. Bauer, Waldo, Wis., assignor to Modern Equipment Company, Port Washington, Wis.

Filed Jan. 26, 1984, Ser. No. 574,080

Int. Cl.³ C22C 33/08

U.S. Cl. 75—130 R 11 Claims



1. A ladle for treatment of molten iron with a reactant, said ladle comprising

a main chamber having sealed top and bottom ends,

a teapot spout communicating with said main chamber of said ladle through a spout opening at the bottom end of said ladle, said spout being operative both for receiving molten iron poured into said ladle and for pouring treated iron out of said ladle,

a dividing wall extending upwardly inside said main chamber from said bottom end of said ladle and forming a compartment within said main chamber adapted to contain the reactant,

an opening in said sealed top end of said main chamber to allow placement of the reactant in said ladle compartment,

a movable airtight cover mounted on said top end of said main chamber to provide said sealed top of said main chamber while said spout remains open to permit selective filling of molten iron into and dispensing of molten iron from said main chamber, and

said dividing wall having a height greater than the height of said spout opening such that said dividing wall extends upwardly to a level above said spout opening and molten iron poured into said ladle fills said spout opening before flowing over said dividing wall into said compartment to react with the reactant, so that gases resulting from the reaction between the molten iron and the reactant cannot escape from said main chamber.

4,509,980

ELECTRICAL CONTACT MATERIAL COMPRISING SILVER, CADMIUM OXIDE AND CUPRIC SALT

Ernest M. Jost, Plainville, Mass., assignor to Chemet Corporation, Attleboro, Mass. and Chemet Corporation, Attleboro, Mass.

Filed May 19, 1983, Ser. No. 496,236

Int. Cl.³ C22C 00/00

U.S. Cl. 75—234 9 Claims

1. A powder compact for use in making an electrical contact comprising

a mixture of silver powder and cadmium oxide powder in which the silver amounts to 70 to 95% by weight of the total and

from 100 to 500 ppm of copper, in the form of water soluble cupric salt, based on the total weight of silver and cadmium oxide.

7. An electrical contact comprising a sintered product of the compact claimed in claim 1.

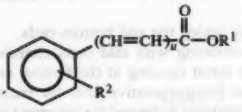
4,509,981

COATING COMPOSITIONS

Albert J. Sanders, Jr., Toledo, Ohio, and Michael J. Larson, Ypsilanti, Mich., assignors to SWS Silicones Corporation, Adrian, Mich.

Filed Jun. 13, 1983, Ser. No. 503,920
Int. Cl.³ C09D 3/49; C09G 1/12
U.S. Cl. 106—3 14 Claims

1. An aqueous emulsion consisting essentially of a mixture of (1) silicone fluids in an amount of from 1 to 60 percent by weight based on the weight of the emulsion, said silicone fluids consisting essentially of (a) from 1 to 99 percent by weight based on the weight of the silicone fluids of an aminofunctional silicone fluid and (b) from 99 to 1 percent by weight based on the weight of the silicone fluids of an organopolysiloxane fluid, (2) a nonionic emulsifying agent in an amount of from 2 to 10 percent by weight based on the weight of the emulsion, (3) an ultraviolet radiation absorbing compound selected from the group consisting of p-aminobenzoic acid and a compound having the formula



where R^1 is selected from the group consisting of a monovalent hydrocarbon radical having from 1 to 12 carbon atoms, an aminoalkyl radical having up to 6 carbon atoms; a monoalkanolaminoalkyl radical, a dialkanolaminoalkyl radical, an alkyl alkoxy radical having from 3 to 12 carbon atoms, a hydroxy substituted alkyl radical having from 2 to 6 carbon atoms, R^2 is selected from the group consisting of hydrogen, OH, OR^3, NH_2, NHR^3, NR_2^3 and R^3, R^3 represents an alkyl radical having from 1 to 4 carbon atoms and u is 0 or 1 with the proviso that when u is 0, R^2 is OH, OR^3, NH_2, NHR^3 and NR_2^3 and when u is 1, R^2 is hydrogen, OH, OR^3 and R^3, and (4) water.

4,509,982

INK COMPOSITION FOR WRITING INSTRUMENTS

Zenshiro Iijima, Abiko, Japan, assignor to Adger Kogyo Co., Ltd., Saitama, Japan

Filed Sep. 28, 1983, Ser. No. 536,758
Claims priority, application Japan, Nov. 29, 1982, 57-209149; Nov. 29, 1982, 57-209148; Jun. 2, 1983, 58-98456; Jun. 2, 1983, 58-98455
Int. Cl.³ C09D 11/00
U.S. Cl. 106—23 5 Claims

1. An ink composition comprising: 0.1 to 20 wt % of a water-insoluble coloring agent;

0.05 to 10 wt % of a water-soluble polymeric material which is a polyethylene oxide having a molecular weight of between about 1×10^5 and 5×10^6;

0.5 to 5 wt % of a nonionic or anionic surfactant having a polyoxyethylene group; and 50 to 90 wt % water.

4,509,983

METHOD OF MANUFACTURING A FOUNDRY MOULD MIX CONTAINING A MOULD BINDER

Ervin I. Szabó, Manotic, and Laurence V. Whiting, Ottawa, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

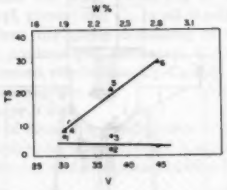
Continuation-in-part of Ser. No. 427,678, Sep. 29, 1982, abandoned. This application Feb. 14, 1983, Ser. No. 580,016
Claims priority, application Canada, Dec. 7, 1983, 391636
Int. Cl.³ B28B 7/34
U.S. Cl. 106—38.2 5 Claims

1. A method of manufacturing a foundry mould mix containing a mould binder, comprising:

(a) mixing a binder with foundry sand in the range 15 to 150 grams of binder per kilogram of foundry sand, the binder consisting essentially of:

(i) at least one acid selected from the group consisting of glycolic acid, lactic acid, α-hydroxy butyric acid, valerolactic acid, α-hydroxy-caproic aicd, tartronic acid, tartaric acid, malic acid, mucic acid, citric acid, gluconic acid, and glyceric acid;

(ii) a precipitant for the acid, the amount of precipitant present in the binder components being equivalent to at least 50% of the stoichiometric requirement of the total acid content of the binder components, said precipitant



comprising at least one substance selected from the group consisting of calcium carbonate and substances composed essentially of calcium carbonate, said precipitant being substantially non-fluxing with the foundry sand, and substantially non-reactive with respect to other mould components than the said total acid content, and substantially non-reactive with respect to metal which is to be cast in the mould; and

(b) water, the water being present in an amount no greater than 2 times the weight of the total acid content, calculated on that acid content being in a water free state.

4,509,984

METHOD FOR PREPARING TIRE CURING BLADDER LUBRICANT

Robert F. Scheiderich, and Louis F. Comper, both of Danville, Va., assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 212,658, Dec. 3, 1980, abandoned. This application Feb. 7, 1983, Ser. No. 464,522
Int. Cl.³ B28B 7/36
U.S. Cl. 106—38.22 1 Claim

1. A method of preparing an aqueous-based lubricant composition which consists essentially of:

(A) mixing under high shear mixing conditions about 10 to about 40 parts by weight bentonite clay having a mesh size in the range of about 100 to about 500 U.S. standard sieve size with about 500 to about 1500 parts by weight water until the mixture thickens where said water is preheated to a temperature in the range of 50° C. to about 85° C. prior to mixing said clay therewith

(B) mixing therewith while maintaining the mixture temperature in the range of about 20° C. to about 95° C., about 15 to about 45 parts by weight polydimethylsiloxane characterized by having a viscosity in the range of about 40,000 to about 120,000 centistokes at 25° C., about 12 to about 36 parts by weight of at least one of polyethylene glycol and polypropylene glycol having a molecular weight in the range of about 1500 to about 2500, and a surfactant for said polydimethylsiloxane and polyglycol and

(C) optionally mixing therewith about 2 to about 10 parts by weight additional surfactant; about 2 to about 8 parts by weight corrosion inhibitor; about 0.2 to about 1 part by weight defoamer; and about 2 to about 10 parts by weight stabilizer.

4,509,985

EARLY HIGH-STRENGTH MINERAL POLYMER

Joseph Davidovits, Saint-Quentin, France, and James L. Sawyer, Friendswood, Tex., assignors to Pyrament Inc., Houston, Tex.

Filed Feb. 22, 1984, Ser. No. 582,279
Int. Cl.[3] C04B *19/04*
U.S. Cl. 106—84 6 Claims

1. An early high strength concrete composition obtained by adding ground blast furnace slag to a reactant mixture consisting of alumino-silicate oxide $(Si_2O_5,Al_2O_2)_n$ with the aluminum cation in four-fold coordination, strong alkalis selected from the group consisting of sodium hydroxide and potassium hydroxide, water and a member selected from the class consisting of sodium and potassium polisilicate solutions, said reactant mixture having the following oxide mole ratio:

M_2O/SiO_2: 0.20 to 0.36
SiO_2/Al_2O_3: 3.0 to 4.12
H_2O/M_2O: 12 to 20
M_2O/Al_2O_3: 0.6 to 1.36

where M_2O represents a member selected from the class consisting of Na_2O, K_2O, and the mixture (Na_2O,K_2O).

4,509,986

COMPOSITION OBTAINED BY MIXING FLY ASH, OXISLUDGE AND PHOSPHOGYPSUM

Carel W. J. Hooykaas, Rotterdam, Netherlands, assignor to Pelt & Hooykaas B.V., Rotterdam, Netherlands

Filed Oct. 19, 1983, Ser. No. 543,430
Claims priority, application Netherlands, Oct. 20, 1982, 8204052
Int. Cl.[3] C04B *11/10*
U.S. Cl. 106—110 9 Claims

1. A composition obtained by mixing a compound presenting pozzolanic properties consisting of fly ash and a moisture-containing base composition consisting of calciumsulfate hemihydrate, the composition containing a reaction product of an inhibitor inhibiting the formation of a loose mass or granules when mixing the base composition and the compound presenting pozzolanic properties, and a compound inactivating this inhibitor consisting of a solid product caught from gases emanating from steel convertors and containing at least a volatile metal or a volatile metal compound.

4,509,987

CALCIUM CARBONATE DISPERSIONS

David Farrar, Bradford, and Malcolm Hawe, Huddersfield, both of England, assignors to Allied Colloids Limited, Bradford, England

Filed Nov. 17, 1982, Ser. No. 442,343
Int. Cl.[3] C01F *11/18;* C09C *3/04*
U.S. Cl. 106—308 Q 16 Claims

1. A dispersion in water containing at least 72% by weight of the dispersion of inorganic particulate material comprising calcium carbonate in the form of ground particles of which at least 87% by weight are less than 2 μm in size and a dispersing agent comprising a copolymer of from 5 to 75% by weight AMPS and 95 to 25% by weight acrylic acid, or a water soluble salt thereof, having a molecular weight in the range 1,000 to 20,000, and the dispersion remains as a flowable dispersion upon standing.

4,509,988

NACREOUS PIGMENTS HAVING IMPROVED LIGHT FASTNESS, THEIR PREPARATION AND USE

Horst Bernhard, Schwarzenberg, Austria, assignor to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Dec. 27, 1982, Ser. No. 453,044
Claims priority, application Fed. Rep. of Germany, Dec. 24, 1981, 3151355
Int. Cl.[3] B32B *19/02;* C04B *31/26;* C09C *1/00, 3/06*
U.S. Cl. 106—308 R 15 Claims

13. In a composition comprising a base ingredient and a pearlescent pigment based on TiO_2 coated mica flakes, the improvement wherein the mica flakes are coated with a metal oxide layer, wherein the metal oxide layer comprises a homogeneous mixture of titanium dioxide, silicon dioxide and iron oxide containing about 0.1 to about 20 percent by weight of silicon dioxide and about 0.1 to about 60 percent by weight of iron oxide.

4,509,989

CLEANING METHOD FOR REMOVING SULFUR CONTAINING DEPOSITS FROM COKE OVEN GAS LINES

L. Walter Sumansky, South Park Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 25, 1983, Ser. No. 478,951
Int. Cl.[3] B08B *9/02;* C11D *3/30*
U.S. Cl. 134—22.12 16 Claims

1. Process for removing from gas lines for handling coal conversion process gases having properties similar to coke oven gas, hard to remove deposits deposited from said gases, said deposits containing high elemental sulfur content and multivalent compounds comprising (1) contacting said deposits with a cleaning composition comprising (a) a major portion of aliphatic amine capable of dissolving said elemental sulfur in the presence of water, (b) water in sufficient quantities to dissolve said multivalent compounds, and (c) sufficient oxidizing or reducing agent to change the valence of said multivalent compounds to a more uniform valent state to thereby be more readily dissolved by said water, (2) allowing said cleaning composition to remain in contact with said deposits for sufficient time to allow sufficient dissolution of said deposits to take place to allow removal of said deposits to take place, and (3) applying such force as is necessary to remove these partially dissolved deposits from said surface.

4,509,990

SOLID PHASE EPITAXY AND REGROWTH PROCESS WITH CONTROLLED DEFECT DENSITY PROFILING FOR HETEROEPITAXIAL SEMICONDUCTOR ON INSULATOR COMPOSITE SUBSTRATES

Prahalad K. Vasudev, Santa Monica, Calif., assignor to Hughes Aircraft Company, El Segundo, Calif.

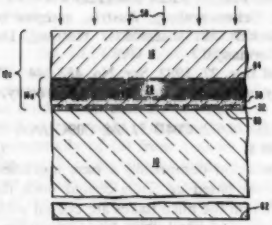
Filed Nov. 15, 1982, Ser. No. 441,477
Int. Cl.[3] H07L *21/263, 21/225*
U.S. Cl. 148—1.5 23 Claims

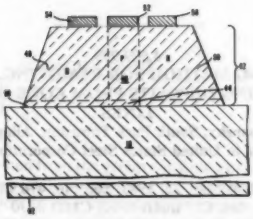
1. A method of fabricating a composite semiconductor/insulator substrate comprising the steps of:

(a) providing a thin layer of semiconductor material adjacent a surface of an insulator, said insulator having a given damage density threshold;

(b) implanting a given ion species into said thin semiconductor layer at an implant energy and dosage sufficient to amorphize a buried layer portion of said semiconductor layer, the average residual implant energy at the surface of said insulator being sufficiently low such that the product of the residual energy and dosage of those ions that pass into said insulator is less than the damage density threshold of said insulator; and

(c) regrowing said amorphous buried layer so as to form a recrystallized buried layer using the unamorphized por-





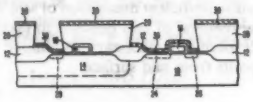
tion of said thin semiconductor layer as a crystallization seed.

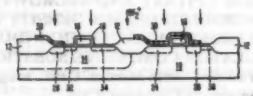
4,509,991

SINGLE MASK PROCESS FOR FABRICATING CMOS STRUCTURE

Yuan Taur, Armonk, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 6, 1983, Ser. No. 539,516
Int. Cl.³ H01L *21/265, 21/26, 7/54*
U.S. Cl. 148—1.5 **7 Claims**





1. A process for implanting self-aligned source and drain regions in a complementary semiconductor structure of the type including a semiconductor substrate having recessed oxide isolation regions, defining at least one pair of device regions, a well region in said semiconductor substrate below one of said device regions, and gate electrodes in said device regions between said recessed oxide regions, said process comprising the steps of

(a) first depositing a layer of photoresist on the surface of said substrate and exposing said photoresist layer through a single lighographic mask, and etching openings in said photoresist layer in accordance with said single lithographic mask such that source and drain regions of a first device region of said at least one pair of device regions are covered by a discrete layer of said photoresist and source and drain regions of a second device region of said at least one pair of device regions adjacent to said first device region are located under said opening in said photoresist layer,

(b) implanting ions of a first conductivity type into said surface of said substrate through said opening in said photoresist layer to form ion implanted source and drain regions in said second device region, implantation of ions into said first device region being blocked by said photoresist layer,

(c) depositing a layer of ion implantation blocking material over said photoresist layer and through said openings in said photoresist layer onto said source and drain regions of said second device region of said substrate,

(d) removing said photoresist layer, thereby exposing said source and drain regions of said first device region of said substrate and maintaining said source and drain regions of said second device region covered by said ion implantation blocking material in a pattern which is the reverse of its first pattern of said photoresist layer in said single photolithographic masking step (a),

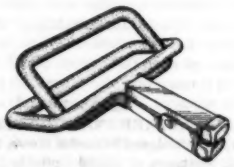
(e) and implanting ions of a second conductivity type into said surface of said substrate for forming ion implanted source and drain regions in said first device region, ion implantation of said second device region being blocked by said layer of ion implantation blocking material such that said source/drain regions of said first device region and said source/drain regions of said second device region are directly self-aligned.

4,509,992

PROCESSES AND COMPOSITIONS FOR THE TREATMENT OF ALUMINUM SURFACES

George L. Higgins, Windsor, England, assignor to Parker Chemical Company, Madison Heights, Mich.

Division of Ser. No. 339,958, Jan. 18, 1982, abandoned. This application Jul. 29, 1983, Ser. No. 518,508
Int. Cl.³ C23F *7/06*
U.S. Cl. 148—6.27 **6 Claims**



1. A process for coating aluminum which comprises contacting an aluminum surface with a composition which comrpises an aqueous solution having a pH of from about 9 to about 12.5 and containing an effective coating forming amount of a complexing agent which has at least one of a nitrogen atom with a lone pair of electrons and a carboxylate group, and an oxidizing agent which solution is substantially free of components which inhibit the coating formation, to form a paint-base coating on such surface having a thickness of at least about 0.5 g/m^2 and, thereafter, applying a siccative coating to the thus-formed paint-base coating.

4,509,993

REGENERATION AGENT FOR CARBURIZATION SALT BATH

Hans-Hermann Beyer, Kahl; Ulrich Baudis, Hanau, and Peter Biberbach, Rodenbach, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Dec. 29, 1983, Ser. No. 566,811

Claims priority, application Fed. Rep. of Germany, Jan. 8, 1983, 3300488

Int. Cl.³ C21D *1/48*

U.S. Cl. 148—15.5 9 Claims

1. A process of regenerating a carburizing salt bath comprising regenerating the bath at a temperature of 800° to 950° C. by adding the polymeric organic compound of claim 1 thereto a polymeric compound having the over-all composition $(C_6H_xN_y)_z$, where

x is 3 to 5

y is 5 to 8

z is 10 to 10,000.

4,509,994

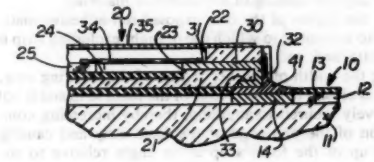
SOLDER COMPOSITION FOR HIGH-DENSITY CIRCUITS

Felix Barajas, Huntington Beach, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Sep. 4, 1984, Ser. No. 646,759

Int. Cl.³ B23K *35/34*

U.S. Cl. 148—24 24 Claims



1. A solder composition especially adapted for soldering components in high-density electronic circuitry, whereby following soldering essentially no solder balls are formed, said solder composition comprising finely divided solder metal dispersed in a liquid vehicle containing (a) a thixotropic agent, (b) an organic solvent and (c) a flux, the particle size of said metal ranging from about 0.2 to about 35 microns, said liquid vehicle being present in an amount of 10 to 14%, and said solder metal being present in an amount of 86 to 90%, by weight of said composition.

4,509,995

METHOD AND APPARATUS FOR QUENCHING

Takeshi Hachisu; Keiji Taguchi, both of Ibaraki; Toshimi Sasaki, Mito; Tetsuo Matsumoto, Tsuchiura, and Nobuyoshi Hidao, Kashiwa, all of Japan, assignors to Hitachi, Ltd. and Hitachi Const. Machinery Co., both of Tokyo, Japan

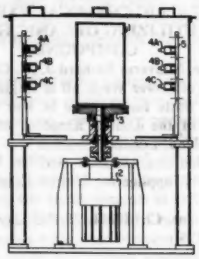
Filed Jan. 19, 1983, Ser. No. 459,148

Claims priority, application Japan, Feb. 12, 1982, 57-19567

Int. Cl.³ C21D *1/18*

U.S. Cl. 148—143 5 Claims

1. A batch-type quenching method wherein a mixed spray jet of a liquid and a gas is applied to at least one discrete object to be quenched during a period of cooling, comprising the steps of providing a supply of said liquid under pressure and a supply of said gas under pressure, providing nozzles around said object to be quenched for applying said mixed spray jet of said liquid and said gas to said object, said nozzles each including a first port in a surface opened to the atmosphere and a second port annularly formed around said first port, said first and second ports being formed on the same plane, directing liquid from said supply of pressure liquid through one of said first and second ports in said nozzle and at the same time directing gas from said supply of pressurized gas through the other of said first and second ports in said nozzle so that said liquid and said gas are jetted out from respective ones of said first and second ports to form a liquid-gas mixture spray jet which impinges upon said object to be quenched during said period of cooling, and varying the mixing ratio between said



liquid and said gas in said mixed spray jet during said period of cooling of said object to be quenched, the step of varying the mixing ratio including spraying only said gas and subsequently spraying a mixture of said liquid and said gas and wherein the diameter of droplets in said mixed spray jet is from 50 to 200 μm.

4,509,996

INJECTION LASER MANUFACTURE

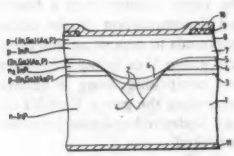
Peter D. Greene, and Stephen E. H. Turley, both of Harlow, England, assignors to International Standard Electric Corporation, New York, N.Y.

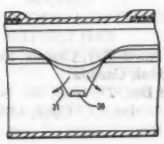
Filed Jun. 24, 1983, Ser. No. 508,293

Claims priority, application United Kingdom, Nov. 5, 1982, 8231655

Int. Cl.³ H01L *21/208*

U.S. Cl. 148—171 9 Claims





1. A method of making an injection laser in which in operation of the completed laser current flow through the laser active layer is confined at least in part by reverse biassed junctions provided by spaced apart parts of a blocking layer, wherein the blocking layer is grown by liquid phase epitaxy upon a non-planar substrate presenting different crystal planes to the growth, the crystal planes being selected such that the growth takes place on spatially separated first surfaces parallel to one of the different crystal planes but not on any second surface situated between and interconnecting the first surfaces and extending along another of the different crystal planes to produce the spaced apart parts of the blocking layer without

recourse to masking thereby permitting this growth to be directly succeeded, without interruption by intermediate processing technology of a different type, by the growth of further layers of the laser structure by liquid phase epitaxy.

4,509,997

ORGANOMETALLIC CHEMICAL VAPOR DEPOSITION OF FILMS UTILIZING ORGANIC HETEROCYCLIC COMPOUNDS

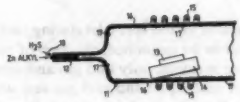
Brian Cockayne, Malvern; Richard J. M. Griffiths, and Peter J. Wright, both of Lower Wick, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

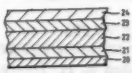
Filed Oct. 18, 1983, Ser. No. 543,003

Claims priority, application United Kingdom, Oct. 19, 1982, 8229830

Int. Cl.³ H01L *21/205, 21/365*

U.S. Cl. 148—175 **8 Claims**





1. In a method of inorganic thin film production including the steps of

(1) forming a vapor stream consisting at least partly of a mixture of the vapors of an organometallic compound and an organic compound incorporating a group V or group VI element, and

(2) passing the vapor mixture over a heated substrate for reaction and decomposition of the organometallic and organic compounds to deposit an inorganic thin film having metal and group V or group VI element constituents,

the improvement comprising using a heterocyclic organic compound incorporating the group V or VI element as a ring member, whereby undesired reaction between vapor stream constituents is inhibited.

4,509,998

EMULSION BLASTING AGENT WITH AMINE-BASED EMULSIFIER

Ernest A. Hajto, North Bay, Canada, assignor to Du Pont Canada Inc., Montreal, Canada

Filed Dec. 27, 1983, Ser. No. 565,775

Int. Cl.³ C06B *45/00*

U.S. Cl. 149—2 **12 Claims**

1. A method for producing a water-in-oil emulsion type explosive composition comprising combining a liquid carbonaceous fuel and an aqueous solution of at least one inorganic oxidizing salt, with agitation, in the presence of ingredients A and B, ingredient A being selected from the group consisting of oleic acid, linoleic acid and mixtures thereof, and ingredient B being selected from the group consisting of C_1–C_6 alkylamines, C_1–C_6 alkyldiamines, hydrazine, C_2–C_6 alkanolamines, urea and mixtures thereof, incorporating dispersed gas bubbles into the resulting water-in-oil emulsion, one of said ingredients A and B being added before or during agitation and the remaining ingredient or ingredients A or B being added during agitation.

4,509,999

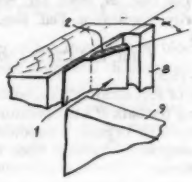
DRAUGHT EXCLUDING STRIPS

John Sandor, Spraylen, Sharmans Close, Harmer Green La., Welwyn, Hertfordshire, England (AL6 OAR)

Filed Feb. 13, 1984, Ser. No. 579,854

Int. Cl.³ B32B *1/00, 3/02, 3/10*

U.S. Cl. 156—71 **13 Claims**



13. A method of attaching a draught excluding strip, comprising the steps of:

providing a resilient foam strip having two parallel flat faces, a securing strip attached to the foam strip so that the foam strip is arranged at one side of the securing strip, the securing strip at least partially overlying one of the flat parallel faces of the foam strip and having a portion projecting beyond the foam strip along only one edge thereof, a coating of a self-adhesive material arranged on the portion of the securing strip projecting beyond the foam strip on the one side of the securing strip, and a cover strip protecting the coating of self-adhesive material;

pressing one region of the thus-exposed self-adhesive material onto a member to which the draught excluding strip is to be attached; and

reducing the width of another region of the securing strip, which is closest to the one edge of the foam strip and is not adhesively secured to anything, thereby increasing compression of the one edge of the foam strip and causing lifting up of the foam strip at an angle relative to the member to seal larger gaps.

4,510,000

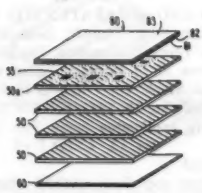
METHOD FOR PALLADIUM ACTIVATING MOLYBDENUM METALLIZED FEATURES ON A CERAMIC SUBSTRATE

Ananda H. Kumar, Wappingers Falls, and Bernard Schwartz, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 30, 1983, Ser. No. 556,732

Int. Cl.³ C04B *35/00, 39/00*

U.S. Cl. 156—89 **5 Claims**



1. A process for coating a molybdenum or tungsten metallurgical pattern on or in a dielectric green sheet with palladium, nickel, platinum or rhodium which comprises:

coating palladium, nickel, platinum or rhodium on a polyvinyl butyral resin layer on a polyester film;

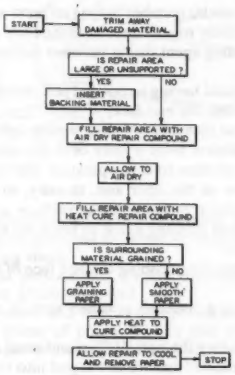
superimposing said polyester coated film on the dielectric green sheet with the palladium, nickel, platinum or rhodium coating adjacent the molybdenum or tungsten metallurgical pattern and the dielectric green sheet;

laminating the resulting assembly;
stripping the polyester film therefrom while permitting the polyvinyl butyral layer and palladium, nickel, platinum or rhodium layer to remain on the molybdenum or tungsten metallurgical pattern and the dielectric green sheet;
sintering the resulting composite to a fired structure, whereby said polyvinyl butyral is volatilized off and said palladium, nickel, platinum or rhodium is alloyed with the molybdenum or tungsten metallurgical pattern to result in a densified structure.

4,510,001
MULTIPLE FILLING METHOD OF REPAIRING DAMAGED MATERIAL

Lawrence L. Speer, 436 Hopocan Ave., Barberton, Ohio 43203

Filed Sep. 8, 1983, Ser. No. 531,174
Int. Cl.³ B32B *35/00*
U.S. Cl. 156—98 **11 Claims**

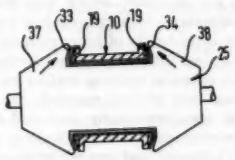


1. A method of repairing damaged vinyl and other material comprising the steps of:
trimming away damaged material to form a repair area in the undamaged material,
substantially filling said repair area with an air drying repair compound,
allowing said repair compound to air dry,
applying a layer of heat curable repair compound over said air drying repair compound, and
applying heat to said heat curable repair compound to cure said compound.

4,510,002
MANUFACTURE OF PNEUMATIC TIRES

Anthony G. Goodfellow, Maghull, England, assignor to W & A Bates Limited, London, England

Filed Oct. 20, 1983, Ser. No. 543,874
Claims priority, application United Kingdom, Nov. 2, 1982, 8231308
Int. Cl.³ B29H *17/22, 17/16*
U.S. Cl. 156—126 **12 Claims**



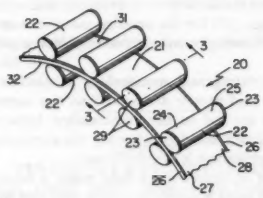
1. A method of manufacturing a partially-built carcass for a pneumatic tyre comprising locating a pair of tyre bead elements coaxially at opposite ends of a bead tube in axially spaced relationship predetermined by the length of the tube, locating within the tube an expansible former around which tyre carcass material is wrapped so that the material extends axially within the tube and the bead elements and projects axially beyond the bead elements at each end, expanding the carcass material to engage the bead elements and turning the projecting ends of the material radially outwardly around the bead elements whilst the bead elements are supported by the tube.

5. Apparatus for manufacturing a pneumatic tyre comprising a bead tube at opposite ends of which tyre bead elements may be located in axially spaced relationship predetermined by the length of the tube, and means for locating the bead tube in a predetermined axial position in coaxial relationship with an expansible former, the bead tube being constructed so as to be capable of supporting the bead elements in said axially spaced relationship during an operation to turn tyre carcass material radially outwardly around the bead elements and to be removable from a partially-built tyre carcass supported therein.

4,510,003
METHOD OF MAKING AN ENDLESS POWER TRANSMISSION BELT CONSTRUCTION

Larry R. Oliver, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Division of Ser. No. 328,177, Dec. 7, 1981, Pat. No. 4,459,125.
This application May 14, 1984, Ser. No. 610,155
Int. Cl.³ B29H *7/22*
U.S. Cl. 156—137 **8 Claims**



1. In a method of making an endless power transmission belt construction having power transmitting contact faces and comprising the steps of forming an axial tensioning means, forming a plurality of lateral stiffening means that are carried by said tensioning means, forming friction material that is carried by at least one of said tensioning means and said stiffening means, and forming said tensioning means and said stiffening means to be a one-piece construction from the same polymeric material that provides an axial and lateral stiffness in excess of that normally provided by polymeric friction material that normally forms the main body of a belt construction that is reinforced with such a tensioning means and stiffening means, the improvement comprising the step of disposing said friction material so that all of said friction material is located only at said contact faces thereof and thereby defines only said contact faces of said belt construction while said tensioning means and stiffening means define all other exposed areas of said belt construction.

4,510,004

APPARATUS AND METHOD FOR PRODUCING A TUBE FROM A CONTINUOUS FORMED EXTRUDED SUPPORTING MATERIAL AND A PROFILED MATERIAL

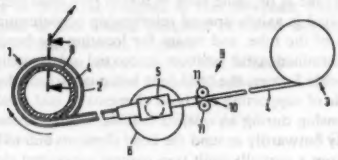
Manfred Hawerkamp, Altenrather Strasse 47, 5210 Troisdorf, Fed. Rep. of Germany

Filed Dec. 21, 1982, Ser. No. 452,012

Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3213551

Int. Cl.³ B31C *1/00, 3/00*

U.S. Cl. 156—143 3 Claims



1. A device for producing a tube, comprising:

a rotatable mandrel (8) over which the tube (1) is formed;

an extruder (5) alongside said mandrel having a nozzle with an opening therethrough for extruding a thermoplastic supporting material (2) which material has a hollow portion and is directed onto said mandrel in a selected angle, said mandrel and said extruder being relatively movable in relation to the axis of said mandrel so as to form a continuous helically wound strip on said mandrel with a welded together seam (7) between adjacent turns to form the tube (1);

a supply bobbin (3) of profiled reinforcing tube material (4) alongside said extruder;

a pair of traction rolls (11) for drawing off the profiled material (4) from said supply bobbin and directing it into said extruder nozzle for combining it with the supporting material (2) to form a combination and presenting the combination onto said mandrel, said roller being disposed between said supply bobbin and said extruder for pushing the profiled material into said nozzle, said rolls defining a feed passage (10) for the profiled material and at least one of said rolls being power driven to push the profiled material; and

means for rotating said mandrel by a relative force with respect to said power driven roll so that substantially no tension is applied to the combination between said extruder and said mandrel whereby the supporting material in the combination is not deformed.

3. A method of producing a tube using a mandrel and an extruder for forming a supporting strip material having a hollow portion, and a reel supply of reinforcement tube material alongside the extruder, the extruder having a nozzle with an opening therethrough for extruding the supporting strip material, comprising:

feeding the reinforcement tube material off the reel supply and passing it through the nozzle of the extruder by pushing the reinforcement tube material into the opening of the nozzle;

combining the reinforcement tube material with the supporting material which is extruded by the extruder to form the supporting strip material; and

presenting the strip material to the mandrel with substantially no tension on the strip material;

feeding the reinforcement tube material being accomplished by engaging the reinforcement tube material between a pair of traction rolls having a passage therein for receiving the reinforcement tube material and driving one of the traction rolls for pushing the reinforcement material into the opening of the nozzle.

4,510,005

METHOD AND APPARATUS FOR RESHAPING AND POLISHING AN END FACE OF AN OPTICAL FIBER

John P. Nijman, Wheaton, Ill., assignor to Allied Corporation, Morristown, N.J.

Filed Sep. 28, 1982, Ser. No. 426,026

Int. Cl.³ G02B *5/14*

U.S. Cl. 156—221 17 Claims

2. A method of terminating a fiber optic cable containing an optical fiber with an end face at one end of the cable, comprising the steps of:

providing a tubular member having an inner surface that is in close proximity to and surrounds the fiber optic cable and a heat bonding agent that is between the inner surface and the cable;

providing a mold having a rounded polished surface adapted for contacting the end face;

urging the end face and polished surface into contact;

directing radiation from a laser onto the mold in order to heat the end face to a temperature above the softening temperature of the fiber and, thereby, to cause the end face to conform to the polished surface; and

heating the heat bonding agent to bond the tubular member to the cable.

7. An apparatus for polishing the end face of an optical fiber comprising:

a mold having a rounded polished surface on at least one side;

means for holding the optical fiber and mold so that the end face and polished surface are urged into contact; and

laser means for heating the end face to a temperature above the softening temperature of the fiber to cause the end face to conform to the polished surface.

4,510,006

PERSONALIZED LAMINATED DISPLAY

A. David Lawson, 135 Suburban Rd., Knoxville, Tenn. 37923

Continuation of Ser. No. 095,110, Nov. 16, 1979, abandoned. This application Sep. 7, 1982, Ser. No. 415,374

Int. Cl.³ B44C *1/16;* B32B *31/00;* G09F *7/16;* A61F *13/02*

U.S. Cl. 156—235 5 Claims

1. A method for fabricating on-the-spot personalized laminated displays comprising the steps of:

selecting a backing sheet having a first and second side, the first side being suitable for use as a background for a personalized display;

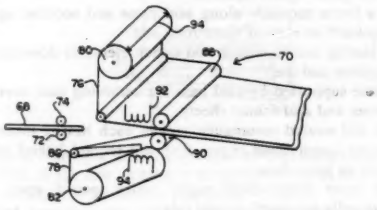
using a die to cut and form precisely shaped and precisely located lettes from a strip of letter material having a selected width, a top side and a bottom side, said bottom side having an adhesive applied thereto, said strip of letter material being sandwiched between a transparent strip and a backing strip, said transparent strip having an outside surface and an inside surface, said inside surface including an adhesive which forms a detachable bond with said top side of said strip of letter material, said backing strip including an adhesive resistant surface and a back surface, said adhesive resistant surface beng detachably bonded to said strip of letter material;

separating said transparent strip, and said formed letters from said letter material and said backing strip such that said precisely formed and spaced letters formed in said strip of letter material remain attached to said transparent strip, and all portions of said strip of letter material other

than said precisely formed letters remain attached to said backing strip;

applying said precisely cut and formed letters attached to said transparent strip to said backing sheet to form said on-the-spot presonalized display;

peeling off said transparent strip such that said precisely formed letters are secured adhesively to said backing sheet and precisely located;



applying decorative indicia to said backing sheet, said decorative indicia including an adhesive on the side contacting said backing sheet;

encasing said personalized display between two sheets of transparent plastic film; and

applying pressure and heat to said personalized display and said two sheets of plastic film to seal said personalized display therebetween to form said personalized laminated display.

4,510,007

METHOD OF JACKETING STEEL PIPES

Walter Stucke, Ratingen, Fed. Rep. of Germany, assignor to Mannesmann AG, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 6, 1983, Ser. No. 511,200

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1982, 3225646; Dec. 20, 1982, 3247510

Int. Cl.³ B29D *23/04*

U.S. Cl. 156—244.12 **9 Claims**

1. Method of jacketing an elongated cylindrical metallic object, comprising the steps of:

heating the object to a temperature of at least 80° Centigrade;

applying a powdery precondensated blend of an epoxy resin and a curing agent to said object, said blend having properties of curing within 50 to 70 minutes at a temperature of 145° to 155° Centigrade, the amount of blend so applied being sufficient to obtain a base layer thickness of 30 to 50 micrometers;

raising the temperature of the epoxy base layer from the outside to about 200° Centigrade by passing the object through a source of thermoenergy to evaporate reaction products from a melted and coherent epoxy coating;

extruding a double hose upon the hot base layer at an extrusion temperature between 165° Centigrade and 190° Centigrade, the double hose having two layers accordingly wherein the inner one of the two layers includes an adhesive of ethylene copolymer, the outer layer of the two-ply hose being a thermoplastic synthetic material, having a thickness so that the ratio of the relative volume of applied hose material to the relative volume of the base is at least 36 to 1;

subsequently curing the base layer by applying the thermoplastically coated object to a cooling medium for about an hour under conditions which limit the temperature of the thermoplastic layer to a temperature of 50° Centigrade to 60° Centigrade; and

subsequently permitting the object with jacket to cool to room temperature.

4,510,008

CONTINUOUS PRODUCTION OF COPPER-CLAD LAMINATE

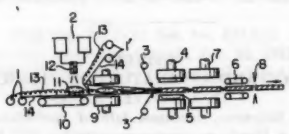
Ikuo Hoshi; Masami Arai, both of Shimodate; Kiyoshi Yokochi, Tochigi; Yasuo Miyadera; Atsushi Fujioka, both of Shimodate, and Takehisa Nakagawa, Yuki, all of Japan, assignors to Hitachi Chemical Company, Ltd., Tokyo, Japan

Filed Oct. 6, 1982, Ser. No. 433,099

Claims priority, application Japan, Oct. 15, 1981, 56-165411

Int. Cl.³ B29C *19/00*

U.S. Cl. 156—245 **11 Claims**



1. A process for continuously producing a copper-clad laminate for printed wiring boards which comprises

running a continuous, fibrous substrate,

supplying partially and intermittently a solventless thermosetting resin mixture to a central portion of at least one surface of the running substrate,

laminating a copper foil to the at least one surface of the running substrate on which the thermosetting resin mixture is supplied,

pressure molding with heating the copper foil laminated substrate in a mold comprising a pair of flat plates at least one of which has projecting portions tapered to the center of the flat plate at the periphery of the flat plate so as not to cut the copper foil and to pinch the copper foil and the substrate,

taking off the molded laminate from the mold while opening the mold, and

cutting the molded laminate.

4,510,009

VENEER SPLICING APPARATUS

Yukio Takagi, Ohbu, Japan, assignor to Meinan Machinery Works, Inc., Japan

Filed Sep. 7, 1983, Ser. No. 530,049

Claims priority, application Japan, Sep. 25, 1982, 57-166969

Int. Cl.³ B65H *19/00*

U.S. Cl. 156—353 **6 Claims**

1. A veneer splicing apparatus comprising

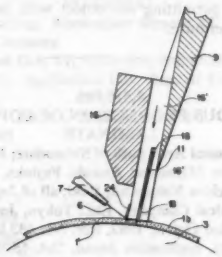
means for conveying veneer sheets having irregular portions along a feed path in a predetermined direction;

sensors for detecting an irregular end portions of a first veneer sheet to produce a trailing end cutting signal and an irregular leading end portion of a second veneer sheet to produce a leading end cutting signal;

cutting tool means provided above the feed path to cut respective veneer sheets in response to relevent signals, said conveying means being adapted to place said first and second veneer sheets in contacting train to define a splicing line;

means for feeding thermoplastic adhesive material along said feed path to cross said veneer splicing line; and

cold pressing means carried by said cutting tool means and adapted to slide relative to said cutting tool means toward



and away from splicing line such that said adhesive material is cold pressed on said first and second veneer sheets.

4,510,010

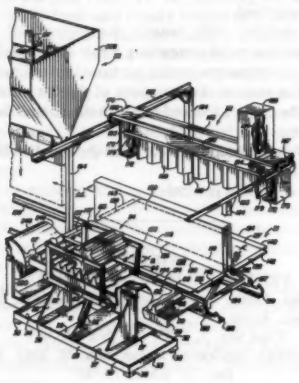
METHOD AND APPARATUS FOR FABRICATING INSULATIVE PANEL

Arthur G. Schramm, deceased, late of Scottsdale, Ariz.; by Doralyn A. Hardy, personal representative, 1522 E. San Juan, Phoenix, Ariz. 85014, and Jack C. Shaffer, 610 E. Montebello #36, Phoenix, Ariz. 85012

Division of Ser. No. 153,072, May 27, 1983, Pat. No. 4,416,715, and a continuation-in-part of Ser. No. 957,665, Nov. 3, 1978, abandoned, which is a continuation-in-part of Ser. No. 937,266, Aug. 31, 1978, abandoned. This application Aug. 8, 1983, Ser. No. 506,609

Int. Cl.[3] **B43M** *3/00;* **B32B** *3/00;* **B29C** *17/40;* **B31F** *5/00*

U.S. Cl. 156—383 **13 Claims**



1. An apparatus for receiving selected components including,

a rectangular filler sheet having a pair of parallel longitudinal edges, a pair of parallel lateral edges, and a pair of opposed faces,

an envelope sheet having a pair of opposed faces, and

a supply of granular loose fill insulative material, said insulative material being of the type conventionally intended for pneumatic or poured application on horizontal surface installations,

and for fabricating a rigid insulative panel from said components, said apparatus comprising:

a base;

a press supported by said base for receiving said filler sheet and impressing selected lateral sections thereof to form a laterally folded sheet therefrom,

wherein said press includes:

(a) a die for receiving said filler sheet and having a plurality of spaced apart die elements defining a plurality of spaced apart recesses therebetween;

(b) a punch having a plurality of spaced apart punch elements extending therefrom, said punch elements being matingly receivable within said recesses between said die elements; and

(c) means for moving said punch relative said die and for urging said punch elements into said recesses for impressing lateral portions of said filler sheet into said recesses and forming said folded sheet wherein said punch elements extend longitudinal of said punch, said punch being carried by a guide means for movement relative said die, said guide means includes:

(a) a frame movable along said press and secured against upward movement therefrom; and

(b) biasing means urging said punch elements downwardly against said die

a table supported by said base for receiving said envelope sheet and said folded sheet;

first and second rectangular panels, each having inner and outer longitudinal edges, first and second lateral edges, and an inner face,

said inner longitudinal edges being spaced apart and hingedly mounted on said table,

said first and said second panels being contractively movable to fold said envelope sheet against the faces of said folded sheet to form a partitioned structure having an open top,

a pair of lateral flaps, one hingedly secured along either lateral edge of said second panel and inwardly movable to fold said envelope sheet against a respective lateral edge of said folded sheet,

including a longitudinal flap hingedly secured along the outer longitudinal edge of said second panel and inwardly movable to fold said envelope sheet and close said opening, including:

(a) marginal anvil portions carried proximate the outer longitudinal edge and the first and second lateral edges of said first panel, said anvil portions extending beyond the respective edges of said folded sheet; and

(b) an abutment member carried by each of said flaps for pressing the respective marginal portion of said envelope sheet against the respective anvil portion;

a receptacle for holding said supply and loose fill insulative material; and

filler means cooperating between said receptacle and said partitioned structure for depositing said insulation into said structure through said open top.

4,510,011

STRIP DEFORMING APPARATUS

Yusaku Azuma; Yoshifumi Kitayama, both of Kodaira, and Shinji Kawaida, Shimonoseki, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed Dec. 23, 1983, Ser. No. 565,176

Claims priority, application Japan, Dec. 28, 1982, 57-234593

Int. Cl.[3] **B32B** *31/00*

U.S. Cl. 156—407 **10 Claims**

1. A strip deforming apparatus for deforming a flexible strip into a looped endless band, comprising

a frame structure having longitudinal and lateral directions;

a first conveyor assembly comprising an endless belt having an upper travelling path portion;

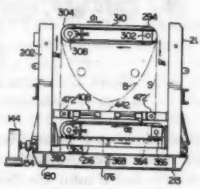
a second conveyor assembly positioned below the first conveyor assembly and comprising an endless belt having an upper travelling path portion substantially parallel with and spaced apart downwardly from the endless belt of the first conveyor assembly;

at least one of the first and second conveyor assemblies being

vertically movable toward and away from the other of the conveyor assemblies;

a third conveyor assembly positioned vertically between the first and second conveyor assemblies and comprising a pair of conveyor rolls elongated in longitudinal directions of said frame structure and each rotatable about the center axis thereof, the conveyor rolls being spaced apart substantially in parallel from each other in a lateral direction of said frame structure;

first conveyor drive means operative to drive at least one of said first and second conveyor assemblies vertically toward and away from the other of the first and second conveyor assemblies;



second conveyor drive means operative to drive the endless belt of the first conveyor assembly to travel in a lateral direction of said frame structure;

third conveyor drive means operative to drive the endless belt of the second conveyor assembly to travel in a direction opposite to the direction of travel of the endless belt of the first conveyor assembly; and

fourth conveyor drive means operative to drive said third conveyor assembly to move vertically between said first and second conveyor assemblies and comprising roll drive means operative to drive said conveyor rolls of the third conveyor assembly to move toward and away from each other in a lateral direction of said frame structure.

4,510,012

TIRE MOLDING APPARATUS

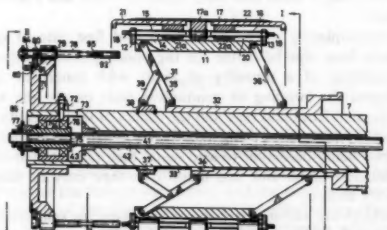
Shinji Kawaida, Yamaguchi; Yoshio Okitsu, and Kazunari Ikeda, both of Tokyo, all of Japan, assignors to Bridgestone Tire Co., Ltd., Tokyo, Japan

Filed Apr. 23, 1984, Ser. No. 602,982

Claims priority, application Japan, May 2, 1983, 58-77872

Int. Cl.³ B29H *17/16*

U.S. Cl. 156—415 **11 Claims**



1. A tire molding apparatus comprising:

a hollow rotary shaft having a drive shaft inserted therein;

first drum segments arranged around one end portion of said rotary shaft;

second drum segments arranged around the other end portion of said rotary shaft, said first and second drum segments being paired with each other to form a molding drum;

diameter changing means provided between said rotary shaft and first and second drum segments for transmitting rotation of said rotary shaft to said first and second drum segments;

threaded shafts screwed respectively into said first and second drum segments to form pairs, wherein rotation of said threaded shafts cause said first and second drum segments to move toward or away from each other and thereby vary the width of said molding drum;

supporting means coupled to one end of said rotary shaft for rotation with said rotary shaft;

a plurality of rotating shafts supported on said supporting means synchronously rotated by said drive shaft; and

transmission members for transmitting rotation of said rotary shafts to said threaded shafts.

4,510,013

APPARATUS FOR PRODUCING MULTI-WALLED THERMOPLASTIC TUBING

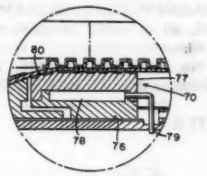
Manfred A. A. Lupke, 35 Ironshield Crescent, and Gerd P. H. Lupke, 46 Stornoway Crescent, both of Thornhill, Ontario, Canada

Filed Sep. 29, 1982, Ser. No. 427,624

Claims priority, application Canada, Jun. 16, 1982, 805321

Int. Cl.³ B32B *31/00;* **B29B** *7/14;* **A01J** *21/02;* **A23G** *1/02*

U.S. Cl. 156—498 **2 Claims**



1. An apparatus for producing multi-walled thermoplastic tubing, including an annular extension die for extruding an inner tube of thermoplastic material co-axially within an outer tube as the latter is advanced in an axial direction, and a mandrel mounted coaxially with said die, downstream thereof for urging said inner tube outwardly and pressing the same to secure it to the outer tube, the mandrel being provided with channels for a cooling fluid to cool its outer surface receiving said inner tube from the die, characterized in that said outer surface is provided with transverse ribs for said pressing in point contact manner, to insure high efficient heat transfer, to prevent sticking of the thermoplastic material to said mandrel and particularly for corrugated thermoplastic outer tubing to provide the penetration of the corrugations of the latter into the inner tube.

4,510,014

APPARATUS FOR SEALING A FILM OR FOIL OR THE LIKE ON TO A CONTAINER

Aldo Artusi, Mühleboden 661, CH-8461 Trüllikon, and Peter Hagmann, Bielstr. 95, CH-4500 Solothurn, both of Switzerland

Filed Nov. 23, 1983, Ser. No. 555,035

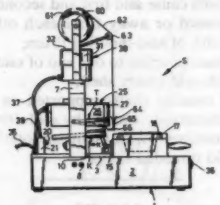
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1983, 3243634

Int. Cl.³ B31F *5/00*

U.S. Cl. 156—522 **7 Claims**

1. Apparatus for sealing a film or foil or the like on to a container, by means of a downwardly movable heating device which is arranged between two columns or pillars bridged by a transverse member and below which the container can be passed, in a carrier member, characterized in that a clamping means (K), for receiving the film or foil (62) or the like, is coupled to the carrier member (15), said clamping means com-

prises guide means (70) which are secured to the columns or pillars (5, 6) and on which are slidably disposed slide members (71) which are each traversed by a respective lever (72) provided with a beak-like projection or lug (73) and rotatable



about an axis (A), and, together therewith, form a clamping gap (74) for receiving the film or foil (62), wherein the lever (72) is connected to the carrier member (15) at the other end from the lug or projection.

4,510,015

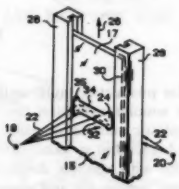
METHOD FOR SEMICONDUCTOR RIBBON-TO-RIBBON CONVERSION

Ralph J. Ellis; Richard W. Gurtler, both of Mesa, and Kalluri R. Sarma, Tempe, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 301,627, Sep. 14, 1981, Pat. No. 4,427,638. This application Jun. 23, 1983, Ser. No. 506,587

Int. Cl.³ C30B *13/06*

U.S. Cl. 156—617 R **5 Claims**



1. In a process for converting a ribbon of polycrystalline material having major surfaces terminating at edges thereof to a ribbon of macrocrystalline material wherein a molten zone is formed in said material by an impinging energy beam and said molten zone is caused to traverse said polycrystalline material in a direction transverse to said edges, as said molten zone passes said material refreezing as macrocrystalline material having enhanced grain size, the improvement which comprises: placing said ribbon of polycrystalline material in a fixture contacting and supporting said ribbon in said fixture; and masking from said impinging energy beam with a portion of said fixture a portion of said material adjacent said edges to prevent said molten zone from extending to said edges.

4,510,016

METHOD OF FABRICATING SUBMICRON SILICON STRUCTURES SUCH AS PERMEABLE BASE TRANSISTORS

Jim-Yong Chi, Bedford, and Roger P. Holmstrom, Wayland, both of Mass., assignors to GTE Laboratories, Waltham, Mass.

Filed Dec. 9, 1982, Ser. No. 448,163

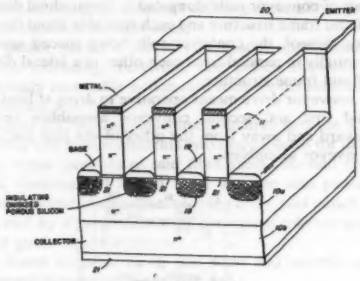
Int. Cl.³ H01L *21/306;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—643 **13 Claims**

1. A method of fabricating silicon structures, comprised of the following steps:

a. forming a plurality of U-grooves in a semiconductor wafer with adjacent grooves defining a structure with a width equal to the distance between said grooves;

b. forming an oxide layer upon the walls of said U-grooves;



c. stripping said oxide layer from said walls, thereby reducing the width of said structure; and

d. repeating steps b and c until the desired width of said structure is obtained.

4,510,017

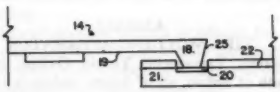
TESTABLE TAPE FOR BONDING LEADS TO SEMICONDUCTOR DIE AND PROCESS FOR MANUFACTURING SAME

Larry J. Barber, Sunnyvale, Calif., assignor to Mesa Technology, Mountain View, Calif.

Filed Feb. 9, 1984, Ser. No. 578,684

Int. Cl.³ C23F *1/02;* **B44C** *1/22;* **C03C** *15/00, 25/06*

U.S. Cl. 156—651 **5 Claims**



1. A process for manufacturing an article for use in forming bonds to conductive pads on a die, such bonds being testable before the die is mounted on the next level of packaging, comprising the steps of:

(1) providing a metal base tape with a first side and a second side;

(2) electroplating a lead pattern on said first side of said metal base tape to define for the bonding a lead pattern consisting of a plurality of leads with innerlead tips aligned for bonding to conductive pads on the die and separated from said tape and the others of said plurality of leads by interstices, using a dissimilar metal, said dissimilar metal being dissimilar to said metal base tape so that said dissimilar metal and said metal base tape may be selectively etched;

(3) selectively etching said metal base tape on said second side to form recesses defining a fill pattern corresponding to portions of said interstices;

(4) filling said recesses in said fill pattern with a dielectric fill to provide a dielectric support for said lead pattern; and

(5) selectively etching said base tape on said first side and said second side simultaneously to remove the portions of said base tape that are left exposed after said steps of electroplating and filling until said plurality of leads in said lead pattern are electrically isolated by interstices and supported across portions of said interstices by said dielectric fill.

4,510,018

SOLUTION AND PROCESS FOR TREATING COPPER AND COPPER ALLOYS

William M. McGowan, Dracut, Mass., assignor to The Lea Manufacturing Company, Waterbury, Conn.

Filed Feb. 21, 1984, Ser. No. 581,812
Int. Cl.[3] C23F *1/00*
U.S. Cl. 156—666 24 Claims

2. A solution for treating copper and copper alloy comprising an aqueous mixture of peroxide and sulfuric acid, a low molecular weight ammonium compound and a fatty acid amine.

4,510,019

LATEX CONTAINING PAPERS

René Bartelloni, Bar Le Duc, France, assignor to Papeteries de Jeand'heurs, Bar Le Duc, France

Continuation-in-part of Ser. No. 349,366, Feb. 16, 1982, Pat. No. 4,445,972, and a continuation-in-part of Ser. No. 397,195, Jul. 12, 1982, , and Ser. No. 441,172, Nov. 12, 1982,. This application Nov. 17, 1982, Ser. No. 442,621
Claims priority, application France, May 12, 1981, 81 09400; Jan. 8, 1982, 82 00224; Apr. 9, 1982, 82 06255
Int. Cl.[3] D21H *5/12*
U.S. Cl. 162—141 6 Claims

1. A method for the continuous manufacture of fibrous paper sheet material from an aqueous fibrous pulp containing at least 7% latex solids comprising the following steps:

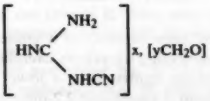
(1) providing water which contains no more than abut 22 mg/l of chlorine, no more than about 46 mg/l of sulfate, no more than about 0.2 mg/l of sulfamate and no more than about 0.2 mg/l of aluminum,

(2) suspending fibrous material having an anionic charge in said water,

(3) measuring the pH and the Zeta potential of said fibrous suspension,

(4) adding to said fibrous suspension a compound which will alter the pH of said fibrous suspension, to adjust the pH of said fibrous suspension to the pH value of the aqueous suspension of latex particles to be added later, the nature and amount of said compound which will alter the pH being such that the suspension will continue to contain no more than about 22 mg/l of chlorine, no more than about 46 mg/l of sulfate, no more than about 0.2 mg/l of sulfamate and no more than about 0.2 mg/l of aluminum,

(5) providing an aqueous solution comprising as bridging agent a condensate of diamide and formaldehyde having the formula:



the ratio x/y being between 0.1 and 3, the molecular weight being between 400 and 1500, and adjusting the Zeta potential of said agueous solution to an absolute value between 60–120% of that of the fibrous suspension and the latex suspension, said adjusting of the Zeta potential being effected by controlling the quantity of said condensate in said aqueous solution,

(6) adjusting the pH of said bridging agent solution to that of the aqueous suspension of latex and the fibrous suspension,

(7) adding the latex suspension to the fibrous suspension in an amount to provide, in the final paper product, at least 7% latex solids,

(8) adding the bridging agent solution to the obtained mixture of latex and fibrous suspension in a quantity such that the obtained mixture has a Zeta potential substantially equal to that of the aqueous starting fibrous suspension and the latex particles remain generally unflocculated, and

(9) forming a paper sheet from the resultant mixture.

4,510,020

LUMEN-LOADED PAPER PULP, ITS PRODUCTION AND USE

Harold V. Green, Dollard des Ormeaux; Thomas J. Fox, Kirkland, and Anthony M. Scallan, Pointe Claire, all of Canada, assignors to Pulp and Paper Research Institute of Canada, Pointe Claire, Canada

Filed Jun. 12, 1980, Ser. No. 158,753
Int. Cl.[3] D21H *3/40*
U.S. Cl. 162—169 20 Claims

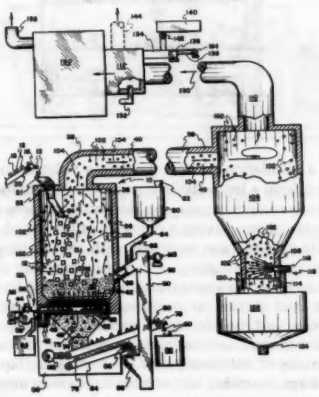
1. Unbleached kraft paper in which substantially all of the filler is within the lumens of the cellulose fibers, said paper having improved strength properties compared to a corresponding conventionally-filled paper containing the same amount of the same filler.

4,510,021

FLUIDIZED BED CHARCOAL PARTICLE PRODUCTION SYSTEM

Norman K. Sowards, Coeur d'Alene, Id., assignor to Energy Products of Idaho, Coeur d'Alene, Id.

Division of Ser. No. 60,329, Jul. 25, 1979, abandoned. This application Mar. 23, 1981, Ser. No. 245,874
The portion of the term of this patent subsequent to Dec. 6, 2000, has been disclaimed.
Int. Cl.[3] C10B *49/10, 49/22, 53/02*
U.S. Cl. 201—4 6 Claims



1. A method of obtaining charcoal from combustible waste comprising the steps of:

introducing combustible waste into a hot fluidized bed of inert non-carbonized material capable of enduring the bed temperature without physical or chemical change;

creating particles of charcoal from the combustible waste within the inert fluidized bed by pyrolytic action;

purging charcoal particles from the fluidized bed solely by elutriation caused solely by forced air passing upwardly through the fluidized bed thereby causing charcoal particles to be suspended above the bed in air and pyrolyzed gas;

maintaining the charcoal particles in said state of suspension while displacing the charcoal particles, the air and the pyrolyzed gas to a location remote from the purging site;

thereafter, separating the suspended charcoal particles from the air and pyrolyzed gas.

4,510,022
SEPARATION OF ISOPROPYL ETHER FROM ISOPROPANOL AND WATER BY EXTRACTIVE DISTILLATION

Lloyd Berg, 1314 S. Third Ave., and An-I Yeh, 709 S. 12th Ave., both of Bozeman, Mont. 59715

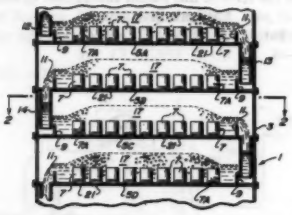
Filed Aug. 8, 1983, Ser. No. 521,375
Int. Cl.³ B01D 3/40; C07C 41/42
U.S. Cl. 203—51 2 Claims

1. A method for recovering essentially anhydrous isopropyl ether from a mixture of isopropyl ether, isopropanol and water, which comprises distilling a mixture of isopropyl ether, isopropanol and water in a rectification column in the presence of an effective amount of an extractive agent, recovering essentially pure isopropyl ether as overhead and obtaining the extractive agent plus isopropanol and water from the stillpot or reboiler, the extractive agent comprises at least dimethylformamide.

4,510,023
PERFORATED BUBBLE CAPS FOR ENHANCED VAPOR/LIQUID CONTACT ON A DISTILLATION TRAY

Douglas L. Bennett, Macungie; Thomas J. Edwards, Allentown, and Howard C. Rowles, Center Valley, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 17, 1983, Ser. No. 505,548
Int. Cl.³ B01D 3/20
U.S. Cl. 203—99 16 Claims



1. In a distillation process wherein a volatile component is separated from a less volatile component in a multicomponent feed which comprises charging said multicomponent feed to a distillation column having a plurality of trays with a plurality of bubble caps thereon equipped with riser sections and first slot openings, converting said multicomponent feed into a liquid fraction and a vapor fraction, passing said liquid fraction from an inlet section to an outlet section on said trays and contacting said bubble caps, passing said vapor fraction through said riser sections and out said first slot openings in said plurality of bubble caps for contacting the liquid fraction on said trays, removing said volatile component as an overhead stream, and removing said less volatile component as a bottoms stream; the improvement for accommodating variable vapor and liquid loads to the trays resulting from the utilization of a multicomponent feed having a wide concentration range of said volatile component or resulting from varying rates of said feed to the distillation column without drastically reducing tray mass transfer efficiency comprising:

utilizing a plurality of unique bubble caps which have second slot openings in addition to said first slot openings, said unique bubble caps being disposed in one or more rows across the width of the liquid pathway from the inlet section to the outlet section on said trays, said first slot openings in all caps being at a level below the liquid level on said trays, such level defining a liquid head Z1 and said second slot openings in said unique caps being at a level below the liquid level on said tray, such level defining a liquid head Z2 with Z2 being less than Z1, and said second slot openings in each said unique cap having a total cross-sectional area of from about 5 to about 30% of the total cross-sectional slot area of said first slot openings in each said cap.

4,510,024
NOVEL POLYMER COMPOSITION

Kazuo Kishida; Isao Sasaki, both of Hiroshima; Nobuhiro Mukai, Ohtake, and Hajime Asai, Hiroshima, all of Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 18, 1983, Ser. No. 542,950
Claims priority, application Japan, Oct. 19, 1982, 57-183294; Oct. 19, 1982, 57-183295; Dec. 27, 1982, 57-226652; Jan. 20, 1983, 58-6601
Int. Cl.³ C25B 3/00
U.S. Cl. 204—59 R 5 Claims

1. A process for producing a polymer composition, wherein an organic polymer is strongly bonded to carbon fiber, by the electrolytic polymerization of a reactive monomer using the carbon fiber as an electrode, the reactive monomer comprising an aliphatic epoxy compound, alicylic epoxy compound, or vinylsilane compound, as a part or all of the reactive monomer.

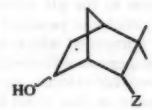
4,510,025
METHOD FOR PRODUCTION OF 3-SUBSTITUTED-2,2-DIMETHYLBICYCLO[2.2.1]HEPTAN-5-OLS AND ESTERS THEREOF

Yoshiharu Matsubara, Toyonaka; Tsuneaki Hirashima, Sakai, and Ikuzo Nishiguchi, Hirakata, all of Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Aug. 24, 1983, Ser. No. 525,898
Int. Cl.³ C25B 3/02
U.S. Cl. 204—78 15 Claims

1. A method of producing a 3-substituted-2,2-dimethylbicyclo[2.2.1]heptan-5-ol of general formula

(I)



wherein Z is $=CH_2$

or

a lower fatty acid ester thereof, or a combination thereof, which comprises subjecting tricyclene, camphene, or a mixture thereof to electrolytic oxidation in a lower fatty acid and isolating the resultant 3-substituted-2,2-dimethylbicyclo[2.2.1-]heptan-5-ol, lower fatty acid ester thereof, or combination thereof.

4,510,026
PROCESS FOR ELECTROLYSIS OF SEA WATER

Placido M. Spaziante, Lugano, Switzerland, assignor to Panclor S.A., Cemano, Switzerland

Filed Nov. 16, 1983, Ser. No. 552,484
Int. Cl.³ C25B 1/26
U.S. Cl. 204—95 5 Claims

1. In the process of electrolysis of sea water in a cell with an anode compartment and a cathode compartment to produce hypohalite, halogen, halate and/or perhalate, the improvement comprising effecting the electrolysis of sea water at least intermittently at a pressure less than 0.7 atmosphere in the cathode compartment.

4,510,027
SIMULTANEOUS LEACHING AND ELECTRODEPOSITION OF PRECIOUS METALS

Tadeusz Wiewiorowski, and Phillip D. Mollere, both of New Orleans, La., assignors to Freeport Minerals Company, New York, N.Y.

Continuation of Ser. No. 254,548, Apr. 15, 1981, abandoned. This application Jan. 4, 1984, Ser. No. 567,155
Int. Cl.³ C25C *1/20*
U.S. Cl. 204—110 **28 Claims**

1. Process for improving the recovery of a precious metal from an ore, comprising:

(a) preparing an aqueous slurry of said precious metal containing ore in ground form, said ore is a member selected from a group consisting of a carbonaceous ore and a mixture of a carbonaceous ore and an oxide ore;

(b) simultaneously leaching and electrodepositing said precious metal from said aqueous slurry of ore in ground form at a temperature between about 140° and 200° F. by:

(i) adding sufficient alkaline material to said aqueous slurry to maintain the liquid phase of said aqueous slurry at a pH between 9.5 and 12;

(ii) adding an effective amount of a precious metal-complexing agent to said aqueous slurry;

(iii) contacting said slurry for 1–48 hours with a cathode made of a metal selected from the group consisting of cadmium, iron, lead, molybdenum, tin, zinc, cobalt, nickel, silver, titanium, tungsten, vanadium, alloys of at least one of such metals and mixtures of at least one of such metals in an amount which provides a ratio of cathode metal surface to ore of 0.01 to 1.0 square foot per pound of dry ore; and

(iv) applying an external negative electric potential to said cathode, whereby simultaneous leaching and electrodeposition of said precious metal occur; and

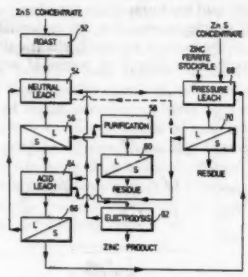
(c) separating said cathode and electrodeposited precious metal from said aqueous slurry whereby at least 75 percent of the precious metal originally present in said ore is recovered, and wherein said improvement in the recovery of said precious metal is the result of the use of said temperature of between about 140° and 200° F., and wherein said improvement in the recovery of said precious metal is independent of a rate of reaction of the process and a concentration of solubilized precious metal.

4,510,028
PROCESS FOR RECOVERING ZINC FROM ZINC FERRITE MATERIAL

Gerald L. Bolton, and Donald R. Weir, both of Fort Saskatchewan, Canada, assignors to Sherritt Gordon Mines Limited, Toronto, Canada

Continuation-in-part of Ser. No. 327,317, Dec. 4, 1981, abandoned. This application Jun. 28, 1983, Ser. No. 508,693
Claims priority, application Canada, Aug. 5, 1981, 383267
Int. Cl.³ C22B *19/22*
U.S. Cl. 204—119 **11 Claims**

1. A process for recovering zinc from iron-containing and zinc sulphide containing material comprising leaching the material in aqueous sulphuric acid solution at elevated pressure under oxidizing conditions and at a temperature in the range of from about 135° C. to about 175° C. with the starting sulphuric acid to zinc molar ratio being less than about 1.2:1 to cause dissolution of a substantial amount of zinc from the sulphide material and to produce a zinc-containing leach solution and an iron-containing undissolved residue, and separating the zinc-containing solution from the iron-containing undissolved residue, and also including the step of adding zinc ferrite containing material to said zinc sulphide containing material to cause the zinc present as zinc ferrite in said leaching to be in the range of from about 5% to about 40% of the total zinc content of the ferrite material and the zinc sulphide material, with the sulphuric acid to total zinc molar ratio being less than about 1.2:1, and to cause at least about 51.5% of zinc to be dissolved

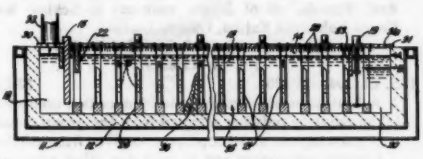


from the ferrite material in addition to the substantial amount of zinc dissolved from the sulphide material.

4,510,029
MOLTEN SALT ELECTROSTRIPPING CELL AND METHOD FOR PURIFYING MOLTEN SALT ELECTROLYTES

Ramaswami Neelameggham, Salt Lake City, Utah; John C. Priscu, Las Vegas, Nev., and Robert D. Toomey, Salt Lake City, Utah, assignors to AMAX Inc., Greenwich, Conn.

Filed May 18, 1984, Ser. No. 611,791
Int. Cl.³ C25C *3/04*
U.S. Cl. 204—130 **10 Claims**



1. The method for electolytically purifying molten magnesium chloride cell feed in a compartmentalized cell having inlet and outlet compartments which comprises establishing a bath of said magnesium chloride cell feed, passing electric current through said molten chloride at a current density less than that required to liberate magnesium from said molten bath to precipitate at least one impurity metal at a cathodic face disposed in a compartment of said cell and immersed in said molten magnesium chloride, while allowing said precipitated impurity to settle at a location beneath said cathodic face, removing purified magnesium chloride from the outlet compartment of said bath, introducing fresh impure molten magnesium chloride to the inlet compartment of said bath and transporting said molten chloride through said bath between said inlet and outlet compartments in a non-turbulent manner so as to avoid reincorporating said precipitated impurity material in said bath.

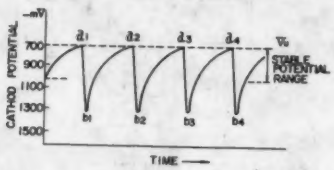
4,510,030
METHOD FOR CATHODIC PROTECTION OF ALUMINUM MATERIAL

Teruo Miyashita, and Koichi Yoshida, both of Ihara, Japan, assignors to Nippon Light Metal Company Limited, Tokyo, Japan

Filed Aug. 9, 1983, Ser. No. 521,753
Claims priority, application Japan, Dec. 21, 1982, 57-222980; Dec. 21, 1982, 57-222981
Int. Cl.³ C23F *13/00*
U.S. Cl. 204—147 **7 Claims**

1. A method for the cathodic protection of an aluminum article against electrochemical corrosive attack by an aqueous

medium with which the article is at least partially in contact, which method comprises the steps of observing the cathodic potential of said article relative to a reference electrode in contact with said medium; when the observed cathodic potential or said article approaches the potential at which pitting corrosion of the same is initiated, electrically connecting said article directly to a source of potential which is sufficiently



electronegative with respect to the observed potential of said article to repress the cathodic potential of said article to within the alkali corrosion range of said article; and after said cathodic potential is repressed to within the alkali corrosion rate but before said article undergoes sufficient alkali corrosion, disconnecting the article from said electronegative potential source whereby the cathodic potential of said article gradually rises to its natural potential in said medium.

4,510,031

HEAT-FOAMABLE OLEFINIC RESIN COMPOSITION AND PROCESS FOR PRODUCTION OF OLEFINIC RESIN FOAM FROM SAID COMPOSITION

Michio Matsumura, Saitama; Takao Inoue, Ageo, and Toshihiro Arai, Hasuda, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 25, 1984, Ser. No. 604,315

Int. Cl.³ C08J 9/10

U.S. Cl. 204—159.20 **22 Claims**

1. A heat-foamable olefinic resin composition comprising

(a) an ethylene polymer selected from the group consisting of polyethylene and a copolymer derived from ethylene as a major component and at least one other ethylenically unsaturated monomer,

(b) a propylene/alpha-olefin copolymer having a melting point of 130° to 160° C.,

(c) a propylene polymer selected from the group consisting of polypropylene and a copolymer derived from propylene as the major component and at least one other ethylenically unsaturated monomer, having a melting point at least 10° C. higher than the melting point of the propylene/alpha-olefin copolymer, and

(d) a blowing agent, and optionally

(e) a crosslinking agent and/or a crosslinking promoting agent.

4,510,032

CHAINS

David A. Timmington, Shatterford Grange, Shatterford, Arley, Worcester, England

Continuation of Ser. No. 478,537, Mar. 25, 1983, abandoned. This application Aug. 6, 1984, Ser. No. 638,533

Claims priority, application United Kingdom, Nov. 12, 1982, 8232420; Mar. 9, 1983, 8306518

Int. Cl.³ C23F 13/00

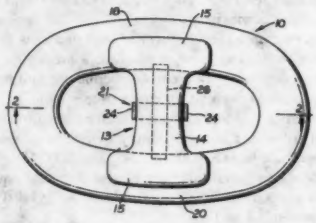
U.S. Cl. 204—197 **9 Claims**

1. A chain comprising a series of interconnected metal chain links, each link comprising a loop portion and a transverse central stud, with an opening on each side of the stud, and at least one link comprising at least one anode member composed of a metal which in corrosive conditions is consumed in preference to the metal of which the link is composed, characterized in that the anode member

(A) does not interfere appreciably with flexing and running of the chain in that the anode member is in the form of a wafer fitted against one side of a link, said wafer comprising

(a) an elongated central portion which fits against an outward facing side of said stud, extends throughout the length of the stud, and has a width not greater than the width of the stud so that it does not encroach on said openings, and

(b) two transverse portions, each of which is integral with the central portion, extends on both sides of the central



portion substantially beyond the width of the central portions, fits against an outward-facing side of said loop, and does not encroach significantly on said openings, and

(B) can be removed and replaced while the chain remains immersed in use, in that said wafer is connected to said link by means comprising a pair of legs projecting from said central portion and extending on both sides of said stud, said legs being composed of metal other than the metal of the anode member.

4,510,033

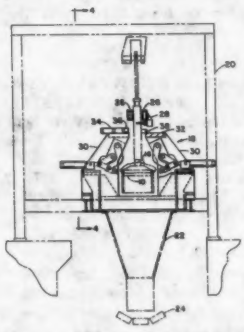
FROZEN ELECTROLYTE BATH REMOVAL APPARATUS

Robert J. Martin, Mars; Lawrence W. Cisko, Irwin, and Bernard C. Turley, Pittsburgh, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Jun. 18, 1984, Ser. No. 621,938

Int. Cl.³ C25C 3/10, 3/14

U.S. Cl. 204—245 **10 Claims**



1. Apparatus for removing frozen electrolyte bath from an electrode body, the apparatus comprising:

a frame;

crust breaking means attached to said frame by linkage means adapted to move said crust breaking means along a predetermined line of travel, said crust breaking means adapted to penetrate and fracture electrolyte bath frozen on an electrode surface from application of a non-reciprocating unidirectional force to said crust breaking means; and

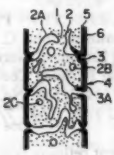
power means to actuate the linkage means and apply sufficient non-reciprocating unidirectional force to said crust breaking means to penetrate and fracture crust frozen on an electrode body as said crust breaking means moves along the line of travel and thereby breaks such crust into discrete pieces which separate from the electrode body.

4,510,034

COATING TYPE INSOLUBLE LEAD DIOXIDE ANODE

Shohzo Ohshima; Mikio Kusuda, and Toshiro Isoya, all of Nobeoka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Aug. 31, 1982, Ser. No. 413,230
Int. Cl.³ C25B *11/00, 1/02*
U.S. Cl. 204—290 F **11 Claims**



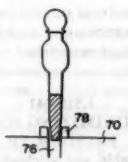
1. A coating type insoluble lead dioxide anode comprising a porous metal substrate consisting of titanium, zirconium or an alloy thereof with a plurality of pores, each having an opening or openings on the surface of the substrate, said substrate having directly coated thereon an intermediate coating layer composed mainly of a platinum group metal or an oxide thereof and an electrode layer of a lead dioxide, at least both the outer surface of the substrate and the peripheral edges of the openings of pores in the substrate being coated with the electrode layer through the intermediate layer.

4,510,035

LIQUID TRANSPORTING AND DISTRIBUTING DEVICE AND IONIC ACTIVITY MEASURING DEVICE USING THE SAME

Osamu Seshimoto, Asaka, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Feb. 16, 1983, Ser. No. 466,961
Claims priority, application Japan, Feb. 16, 1982, 57-23149
Int. Cl.³ G01N *27/28*
U.S. Cl. 204—411 **1 Claim**



1. An ionic activity measuring device comprising:

(a) a liquid transporting and distributing device comprising an outer surface, at least two independent hollow liquid passages positioned in the interior, at least two independent liquid introducing holes which extend from said outer surface to each of said hollow liquid passages, liquid outlet openings extending from the respective hollow liquid passages to said outer surface, at least one liquid outlet opening being provided for each hollow liquid passage, and air discharging holes extending from respective hollow liquid passages to said outer surface, at least one air discharging hole being provided for each hollow liquid passage;

(b) solid electrodes which are in contact with said liquid outlet openings and which are provided in a number equal to the number of said liquid outlet openings; and

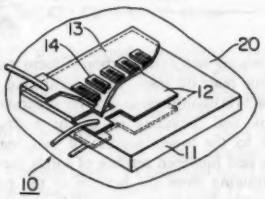
(c) at least one bridge extending between said liquid introducing holes, between said hollow liquid passages, or between said liquid outlet openings, wherein each of the sections of said liquid introducing holes intersecting with said outer surface or the vicinities of said sections comprises an annular projection extending above said outer surface which functions as an adapter means for receiving or fitting with a liquid supply port of a liquid introducing means in airtight relation therewith for liquid injection into the liquid introducing holes.

4,510,036

LIMITING ELECTRIC CURRENT TYPE OXYGEN SENSOR WITH HEATER AND LIMITING ELECTRIC CURRENT TYPE OXYGEN CONCENTRATION DETECTING DEVICE USING THE SAME

Takashi Takeuchi; Hideaki Takahashi; Keiichi Saji; Haruyoshi Kondo, and Kiyoharu Hayakawa, all of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chouo Kenkyusho, Aichi, Japan

Filed Jan. 14, 1983, Ser. No. 457,888
Claims priority, application Japan, Jan. 21, 1982, 57-6846
Int. Cl.³ G01N *27/58*
U.S. Cl. 204—425 **8 Claims**



1. A limiting electric current type oxygen concentration detecting device, comprising:

a limiting electric current type oxygen sensor with a microheater including an oxygen ionic conductor, an anode and a cathode respectively formed on two major surfaces of said oxygen ionic conductor, an insulating film which has a porosity between 0.2 and 3.1%, an average pore diameter between 140 Å and 190 Å, and a thickness between 0.6 and 10 μm, and which is formed on one of said anode and said cathode to regulate the flow rate of oxygen gas to provide electrical insulation, said microheater being on said insulating film, whereby said oxygen ionic conductor is electrically insulated from said heater through said insulating film; and

constant temperature control circuit means for detecting the temperature of said microheater by measuring the resistance thereof so as to keep the heater temperature constant in accordance with the detection of the temperature.

4,510,037

HYDROGENATION PROCESS FOR SOLID CARBONACEOUS FEED MATERIALS USING THERMAL COUNTERCURRENT FLOW REACTION ZONE

Edwin S. Johanson, Princeton, and Paul D. Schuler, Hamilton Square, both of N.J., assignors to HRI, Inc., Gibbsboro, N.J.

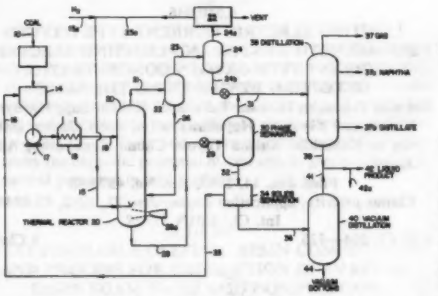
Filed Dec. 23, 1983, Ser. No. 565,248
Int. Cl.³ C10G *1/08*
U.S. Cl. 208—8 LE **12 Claims**

1. A continuous process for thermal hydrogenation and conversion of solid carbonaceous feed materials to produce

hydrocarbon gaseous and liquid products, and avoid accumulation of solids and agglomerates in the reaction zone, which process comprises:

(a) introducing a solid carbonaceous feed material into the upper portion of a thermal reaction zone, and introducing hydrogen and a recycled hydrocarbon liquid into the bottom portion of said reaction zone for upward flow therethrough countercurrent with said carbonaceous feed material so as to provide hindered settling of solids therein;

(b) hydrogenating the carbonaceous feed material in said reaction zone at conditions within ranges of 750°–900° F. temperature and 1000–5000 psi hydrogen partial pressure and without an added catalyst material to form a hydrocarbon gaseous and liquid effluent mixture;



(c) withdrawing said hydrocarbon effluent mixture from the top of the reaction zone, phase separating the mixture at near reaction conditions to recover separate gas and liquid fractions, and recycling all of the hydrocarbon liquid fraction to the lower portion of said reaction zone to provide said hindered settling of solids therein; and

(d) withdrawing from the bottom of the reaction zone a hydrocarbon liquid slurry material comprising solids and agglomerates not exceeding about 40 weight percent of the liquid slurry, and passing said liquid together with agglomerates and solids material to further processing steps to recover hydrocarbon liquid products, whereby accumulation of agglomerates and solids in the reaction zone lower end is prevented.

4,510,038

COAL LIQUEFACTION USING VACUUM DISTILLATION AND AN EXTERNAL RESIDUUM FEED

Christopher W. Kuehler, Larkspur, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 15, 1982, Ser. No. 434,656
Int. Cl.³ C10G *1/06, 1/00*
U.S. Cl. 208—10 **15 Claims**

1. A process for liquefying coal comprising:

(a) heating a slurry comprising a petroleum or petroleum-derived solvent and particulate coal in a dissolution zone to substantially dissolve the coal to produce a first effluent containing undissolved solids;

(b) adding petroleum residuum from an external source to at least a portion of the first effluent to produce a second effluent containing said solids; and

(c) distilling the second effluent under reduced pressure to produce an overhead fraction and a bottoms fraction containing said solids.

4,510,039

PROCESS FOR THE LIQUID PHASE HYDROGENATION OF COAL

Prégermain Simone, Paris; Charcosset Henri, and Andrés Michele, both of Villeurbanne, all of France, assignors to Charbonnages de France and Gaz de France, both of Paris, France

Filed Apr. 15, 1983, Ser. No. 485,247
Claims priority, application France, Apr. 15, 1982, 82 06492
Int. Cl.³ C10G *1/06*
U.S. Cl. 208—10 **12 Claims**

1. A process for the hydrogenation of coal in the liquid phase, comprising the step of hydrogenating said coal in the presence of a catalyst consisting essentially of an iron oxide obtained by decomposition of a vaporized iron compound in the flame of a torch.

4,510,040

COAL LIQUEFACTION PROCESS

Ronald W. Skinner, Allentown; John C. Tao, Perkiomenville, both of Pa., and Samuel Znaimer, Vancouver, Canada, assignors to International Coal Refining Company, Allentown, Pa.

Filed Nov. 7, 1983, Ser. No. 549,694
Int. Cl.³ C10G *1/06, 1/00, 7/00, 17/04*
U.S. Cl. 208—10 **5 Claims**

1. In a process for solvent refining coal, comprising forming a slurry of finely divided coal and a solvent therefor, contacting said slurry with hydrogen-rich gas, heating said slurry in the presence of said hydrogen-rich gas, reacting said heated slurry to dissolve at least some of said coal, adding fresh hydrogen as required to form a liquified coal slurry, passing said liquified coal slurry to a separator in which a vapor product stream and a condensed product stream are separated, passing the condensed product stream to a distillation system, and removing therefrom a residual bottoms product, passing said residual bottoms product to a critical solvent deashing process wherein said product is mixed with a deashing solvent to form a deashing stage slurry, passing said deashing stage slurry into deashing separators in which a light upper phase, a lower heavy phase, and a still heavier ash concentrate stream are separated, recycling said heavy lower phase to the head of the process, and passing said ash concentrate to a gasifier, the improvement wherein said light upper phase, consisting of Light Solvent Refined Coal is mixed with a suitable hydrocracker solvent in a ratio of at least 50:50 at a temperature of at least 250° F. (121° C.) and passed through a fixed catalyst bed hydrocracker operated at a temperature of at least 650° F. (343° C.) and a pressure of at least 1500 psig (1034 Kpa) the product of which is passed to a separator and then to a vacuum distillation apparatus, the fractions resulting therefrom constituting hydrocracker recycle solvent produced by the hydrocracking of said light solvent refined coal material and used as solvent for the hydrocracking of said Light Solvent Refined Coal and desired product materials.

4,510,041

METHOD FOR MINIMIZING FOULING OF HEAT EXCHANGER

Richard F. Miller, Humble, and Michael P. Nicholson, Houston, both of Tex., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 10, 1984, Ser. No. 639,893
Int. Cl.³ C10G *9/16*
U.S. Cl. 208—48 AA **5 Claims**

1. In a method of inhibiting fouling of hydrocarbon processing equipment during the processing of hydrocarbons at elevated temperatures comprising introducing into the equipment an amount of an antifoulant agent effective to substantially reduce the rate of fouling, the improvement comprising using as the agent a combination of:

(1) at least one dimer selected from the N,N' dimers of phenothiazine, halo-substituted phenothiazine, alkyl-sub-

stituted phenothiazine and haloalkyl-substituted phenothiazines, and

(2) at least one alkylphenol.

4,510,042

HEAVY OIL PROCESS WITH HYDROVISBREAKING, HYDRODEMETALLATION AND HYDRODESULFURATION

Alain Billon, Orliénas; Yves Jacquin, Sevres; Jean-Pierre Peries, Mornant, and Hervé Toulhoat, Le Pecq, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Dec. 30, 1983, Ser. No. 567,208

Claims priority, application France, Dec. 30, 1982, 82 22210

Int. Cl.³ C10G *23/02*

U.S. Cl. 208—59 **14 Claims**

1. A process for converting a charge of an asphaltene-containing heavy oil fraction to a lighter oil, comprising the steps of:

(a) subjecting the charge, admixed with hydrogen, to hydrovisbreaking, at a pressure of 40–200 bar, a temperature of 420°–500° C., a ratio of the normalized volume of hydrogen to the volume of charge of 300–3000, and a residence time of 10 seconds to 15 minutes;

(b) passing the effluent from step (a), admixed with hydrogen, under hydrodemetallation conditions, over a catalyst containing alumina and at least one metal from at least one of groups V, VI and VIII (iron group), said catalyst consisting of juxtaposed conglomerates each formed of a plurality of acicular plates, the plates of each conglomerate being generally radially oriented with respect to one another and with respect to the center of the conglomerate, wherein said catalyst contains a major proportion of wedge-shaped mesopores, and has an improved resistance to pore mouth plugging compared with bimodal or monomodal porous catalysts; and

(c) treating the effluent from step (b) with hydrogen, in contact with a catalyst containing alumina, and at least one metal or metal compound selected from molybdenum, tungsten, nickel, cobalt, iron or compounds thereof, under hydrodesulfuration conditions.

4,510,043

PROCESS FOR DEWAXING OF PETROLEUM OILS PRIOR TO DEMETALATION AND DESULFURIZATION

Stephen M. Oleck, Moorestown, and Robert C. Wilson, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Feb. 16, 1984, Ser. No. 580,924

Int. Cl.³ C10G *65/02, 45/64*

U.S. Cl. 208—97 **20 Claims**

1. In a process for demetalation and desulfurization of residual oil by contacting a residual oil with demetalation and desulfurization catalysts under hydrotreating conditions effective to significantly reduce the metals and sulfur contents of said residual oil, the improvement which comprises:

prior to contacting said residual oil with demetalation and desulfurization catalysts, contacting said residual oil, under hydrodewaxing operating conditions effective to significantly reduce the pour point of said residual oil and to cause substantially little demetalization of said residual oil, with a catalyst comprising about 1 to about 10 weight percent of an iron group metal and about 5 to about 25 weight percent of a Group VIB metal, said metals based on the total catalyst, and being present as the oxides or sulfides on a support comprising a composite of alumina and about 5 to about 25 weight percent of ZSM-5 crystalline zeolite based on the total composite, said catalyst having at least 60 percent of its pore volume in the 50 to 200 Angstroms diameter range.

9. In a process for demetalation and desulfurization of residual oil by contacting a residual oil with demetalation and desulfurization catalysts under hydrotreating conditions effective to significantly reduce the metals and sulfur contents of said residual oil, the improvement which comprises:

prior to contacting said residual oil with demetalation and desulfurization catalysts, contacting said residual oil, under hydrowaxing operating conditions effective to significantly reduce the pour point of said residual oil and to cause substantially little demetalization of said residual oil, with a catalyst comprising about 1 to about 10 weight percent of an iron group metal and about 5 to about 25 weight percent of a Group VIB metal, said metals based on the total catalyst, and being present as the oxides or sulfides on a support comprising a composite of alumina and about 5 to about 25 weight percent of ZSM-5 crystalline zeolite based on the total composite, said catalyst having at least 50 percent of its pore volume in the 30 to 100 Angstroms diameter range.

4,510,044

PROCESS FOR HYDROTREATING PETROLEUM RESIDUA AND CATALYST THEREFOR

Stephen M. Oleck, Moorestown, and Robert C. Wilson, Jr., Woodbury, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 346,439, Feb. 8, 1982, Pat. No. 4,458,024.

This application Feb. 21, 1984, Ser. No. 582,212

The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

Int. Cl.³ C10G *45/12, 45/64*

U.S. Cl. 208—111 **8 Claims**

1. A process for simultaneously catalytically hydrodesulfurizing and hydrodewaxing a petroleum base stock, said process comprising contacting a mixture of hydrogen and said base stock at a hydrogen pressure of from about 500 to 3,000 psig, a temperature of from about 600° to 850° F. and a space velocity of from about 0.1 to 5.0 LHSV with a catalyst comprising 10–30 wt. % of a zeolite having a Constraint Index of from 1 to 12 and a silica/alumina mole ratio of at least 12, 70–90 wt. % of alumina, based on alumina plus zeolite, and 10–25 wt. %, expressed as oxides, of at least one Group VIII metal selected from the group consisting of nickel, cobalt and iron, and at least one Group VIB metal, based on total catalyst, said catalyst having about 80% of its pore volume in pores no greater than 100 Angstrom units in diameter and at least 90% of its pore volume in pores no greater than 150 Angstrom units in diameter.

4,510,045

HYDROCARBON DEWAXING PROCESS USING STEAM-ACTIVATED ALKALI METAL ZEOLITE CATALYST

Ralph M. Dessau, Edison, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 382,863, May 28, 1982, Pat. No. 4,443,554.

This application Mar. 16, 1984, Ser. No. 590,237

Int. Cl.³ C10G *47/16*

U.S. Cl. 208—111 **6 Claims**

1. In a hydrodewaxing process wherein wax-containing hydrocarbon feedstock is passed over an alkali metal zeolite having a silica to alumina ratio greater than about 12, a constraint index of about 1 to 12, and an initial alpha value less than about 2 in the presence of hydrogen under dewaxing conditions of elevated temperature and pressure, the improvement which comprises:

forming a mixture of the alkali metal zeolite with alumina and steaming the mixture at a temperature of at least about 300° C. for at least two hours to increase alpha value.

4,510,046
CATALYTIC HYDRODENITROGENATION OF ORGANIC COMPOUNDS

Stephen L. Parrott, c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

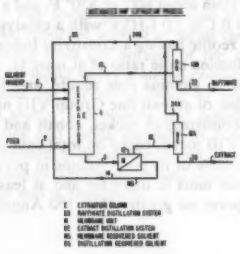
Filed Dec. 6, 1983, Ser. No. 558,651
Int. Cl.³ C10G *45/04, 45/10*
U.S. Cl. 208—254 H 7 Claims

1. A process for the catalytic hydrodenitrogenation of an organic nitrogen compound comprising the step of contacting said organic nitrogen compound under suitable hydrodenitrogenation conditions with a catalyst composition consisting essentially of platinum, titanium and a of high purity gamma alumina support.

4,510,047
SELECTIVE EXTRACTION SOLVENT RECOVERY USING REGENERATED CELLULOSE MEMBRANE UNDER REVERSE OSMOSIS CONDITIONS

John A. Thompson, Wyoming, Canada, assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Dec. 14, 1983, Ser. No. 561,169
Int. Cl.³ C07C *7/144*; C10G *31/00*
U.S. Cl. 208—321 12 Claims



1. In a process for the solvent extraction of aromatic hydrocarbon from a hydrocarbon feed stream comprising aromatic and non-aromatic hydrocarbons using an extraction solvent selective for aromatics wherein the hydrocarbon feed stream is contacted with said solvent resulting in the formation of an extract phase and a raffinate phase wherein the major concentration of the solvent and aromatic hydrocarbons is present in the extract and a minor concentration of the solvent is present in the raffinate phase and wherein said solvent is recovered from the solvent rich extract phase, the solvent lean raffinate phase or both for recycle to the solvent extraction process, the improvement comprising:

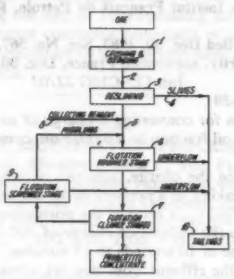
(a) recovering selective solvent by contacting at least a portion of the solvent rich extract phase, the solvent lean raffinate phase or both under pressure with a regenerated cellulose membrane under reverse osmosis conditions whereby the solvent selectively permeates through the membrane resulting in the formation of a solvent rich permeate phase and a solvent lean retentate phase; and

(b) recycling the recovered solvent rich permeate phase to the extraction process.

4,510,048
PROCESS FOR IMPROVING PROBERTITE CONCENTRATION IN PROBERTITE CONTAINING ORE

Anh Mai, Grand Rapids; Donald J. Kaczynski, Pengilly, both of Minn., and Lawrence W. Trainor, deceased, late of Portales, N. Mex. (by Marie L. Trainor, executrix), assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 26, 1983, Ser. No. 535,513
Int. Cl.³ B03B *1/00*
U.S. Cl. 209—3 7 Claims



1. A process for recovering a probertite concentrate from borate ore in which the major borate mineral is probertite which comprises:

(a) crushing the ore;

(b) desliming the crushed ore at from about 14 to about 20 microns to produce a deslimed product;

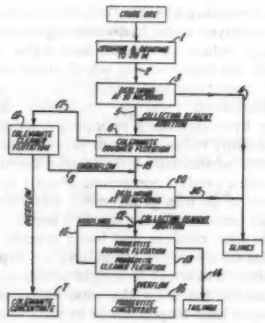
(c) floating the deslimed product and a collecting agent into a flotation stage and separating a probertite concentrate as an overflow stream wherein said collecting agent is an anionic petroleum sulfonate or a mixture of anionic petroleum sulfonates; and,

(d) recovering the probertite concentrate.

4,510,049
PROCESS FOR RECOVERY OF COLEMANITE AND PROBERTITE FROM MIXED LOW GRADE ORE

Anh Mai, Grand Rapids; Donald J. Kaczynski, Pengilly, both of Minn., and Lawrence W. Trainor, deceased, late of Portales, N. Mex. (by Marie L. Trainor, executor), assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Sep. 26, 1983, Ser. No. 535,521
Int. Cl.³ B03B *1/00*
U.S. Cl. 209—3 7 Claims



1. A method of producing concentrates of colemanite and probertite from mixed low grade crude ore which comprises:

(a) crushing the ore;

(b) desliming the crushed ore at about 10 microns and recovering a combined product;

(c) floating the combined product to separate a colemanite-rich fraction and a probertite-rich fraction, removing the colemanite-rich fraction as an overflow stream and removing the probertite-rich fraction as an underflow stream, wherein said floatings are done in contact with a collecting agent, wherein said collecting agent is an anionic petroluem sulfonate or a mixture of anionic petroleum sulfonates.

(d) desliming the probertite-rich fraction at about 20 microns; and

(e) individually floating the probertite-rich fraction and the colemanite-rich fraction to produce a probertite concentrate and a colemanite concentrate, and recovering the probertite concentrate as an overflow stream and recovering the colemanite concentrate as an overflow stream, wherein said floatings are done in contact with a collecting agent, wherein said collecting agent is an anionic petroleum sulfonate or a mixture of anionic petroleum sulfonates.

4,510,050

METAL TRITHIOCARBONATES AS DEPRESSANTS

Robert M. Parlman; Clarence R. Bresson, and Tommy L. Young, all c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Oct. 26, 1982, Ser. No. 436,883
Int. Cl.³ B03D *1/14*
U.S. Cl. 209—167 **12 Claims**

1. Process for depressing copper and/or iron minerals in a minerals containing mixture from which molybdenum is to be recovered in a flotation operation comprising treating the minerals containing mixture with charcoal and carrying out a flotation with a depressant composition present comprising at least one compound selected from the group consisting of M_2CS_3 and $M'CS_3$ wherein the components M which can be the same or different are selected from the group consisting of NH_4 and alkali metals and M' is an alkaline earth metal whereby molybdenum is recovered from a resulting flotation froth and copper and/or iron materials are recovered from a resulting flotation tail product.

4,510,051

FILTER DESIGNED FOR THE SIMULTANEOUS FILTRATION AND PREHEATING OF THE FUEL

Andre Diry, Lotissement en Boussoy, Saint Martin Sous Montaigu (Saone et Loire), France

Filed Jul. 23, 1981, Ser. No. 286,238
Claims priority, application France, Jul. 24, 1980, 80 16629
Int. Cl.³ B01D *35/18*
U.S. Cl. 210—94 **15 Claims**

1. A fuel filter apparatus for heating fuel and filtering from said fuel particulate contaminants and remaining contaminants heavier than fuel prior to injecting said fuel into a combustion chamber of an internal combustion engine, said fuel filter apparatus comprising:

a barrel housing having an upper end and a lower end;

a first chamber in said barrel housing;

inlet passage means into said barrel housing at said upper end thereof, said inlet passage means further having an inlet aperture at one end thereof for interconnection with a source of fuel and an outlet aperture at the opposite end thereof opening into said first chamber in said barrel housing;

a transparent cover member removably mounted at said lower end of said barrel housing;

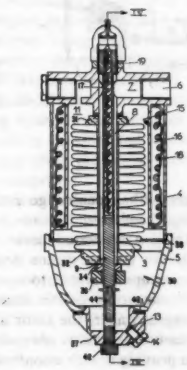
a collecting chamber formed in said transparent cover member and interposed between said transparent cover member and said first chamber of said barrel housing and communicating with said first chamber;

indicator means located in said collecting chamber comprising an indicator member having a specific gravity greater than that of said fuel;

means for securing and sealing said transparent cover member to said barrel housing so that said transparent cover member and said barrel housing together define a leak-proof assembly;

an annular filtering element positioned in said first chamber in said barrel housing, said annular filtering element having one end mounted adjacent to said outlet aperture of said inlet passage means of said barrel housing and further having an opposite end adjacent to said means for securing and sealing said transparent cover member;

a vertically disposed central passage in said annular filtering element having a first end and an oppositely disposed second end, said central passage communicating at said first end with said outlet aperture of said inlet passage means of said barrel housing and being sealed at said second end by said means for securing and sealing said transparent cover member such that said annular filtering element divides said first chamber into a first portion comprising said central passage and communicating with said inlet passage means and an outer annular portion external of said annular filtering element and communicating with said collecting chamber whereby fuel flows from



said central passage to said outer annular portion through said annular filtering element;

an outlet passage means in said barrel housing at said upper end thereof, said outlet passage means further having an inlet aperture at one end thereof opening into said outer annular portion of said first chamber and an outlet aperture at the opposite end thereof, such that said fuel entering said inlet aperture of said inlet passage means flows through said inlet passage means into said central passage of said annular filtering element and through said annular filtering element into said outer annular portion of said first chamber and through said outlet passage means to said outlet aperture thereof, said annular filtering element removing the undesired particulate contaminants from said fuel so that said fuel cleaned by said annular filtering element flows into said outer annular portion of said first chamber; and

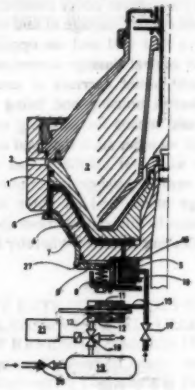
means for heating said fuel flowing through said fuel filter apparatus, said heating means heating said fuel in said annular portion of said first chamber to melt any paraffin in said fuel, said remaining contaminants heavier than said fuel settling into said collecting chamber, said heated and filtered fuel thereafter flowing through said outlet passage of said outer annular portion of said first chamber.

4,510,052

OPERATING SYSTEM FOR CENTRIFUGAL SEPARATORS

Ulf Eklöf, Södertälje, Sweden, assignor to Alfa-Laval Separation AB, Tumba, Sweden

Filed Feb. 3, 1984, Ser. No. 576,549
Int. Cl.³ B04B 11/00
U.S. Cl. 210—139 6 Claims



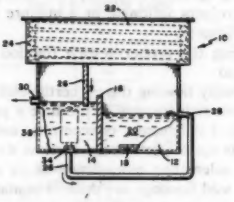
1. In combination with a centrifuge rotor having means defining a separating chamber and means defining peripheral outlets for discharging a separated heavy phase from said chamber, the rotor also having means defining an opening chamber and valve means operable to open said outlets in response to the presence of a certain amount of operating liquid in said opening chamber, the rotor also having means defining a central receiving chamber communicating with said opening chamber to provide it with a controlled supply of said liquid for operating said valve means to open and close the peripheral outlets, an injector device having a static outlet for supplying the operating liquid to said receiving chamber, said device being located outside the rotor and comprising a housing, a movable wall in the housing defining an operating liquid side and a compressed air side of the housing, said operating liquid side being connected with said static outlet, liquid source means connected to said operating liquid side and of sufficient pressure to provide hydraulic contact between said static outlet and said operating liquid side, said source means being operable to refill the injector housing and return said movable wall to an end position in preparation for a new opening and closing of said peripheral outlets, a venting valve associated with said compressed air side for venting air therefrom as the movable wall is returned to said end position, a pressure vessel, means for connecting said vessel to a compressed air source and for adjusting the air pressure in the vessel, and a time-controlled air valve through which said pressure vessel is connected with said compressed air side, the injector device being operable upon opening of said air valve to instantaneously transmit the air pressure in said vessel to hydraulic pressure in a body of the operating liquid extending continuously from said movable wall to said static outlet, and to instantaneously inject operating liquid into said receiving chamber at an injection velocity dependent upon the adjusted air pressure in said vessel.

4,510,053

VAPOR DEGREASER APPARATUS

Jeffrey C. Smith, Prospect, Conn., assignor to Branson Ultrasonics Corporation, Danbury, Conn.

Filed Jul. 20, 1983, Ser. No. 515,492
Int. Cl.³ B01D 15/00
U.S. Cl. 210—175 3 Claims



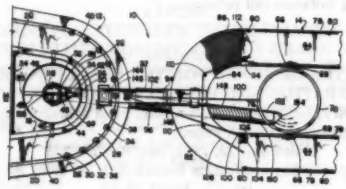
2. A vapor degreaser apparatus comprising a boiling sump and an adjacently disposed water separator sump, a drain pipe terminating in said water separator sump for removing dry solvent from said water separator sump and returning said dry solvent to said boiling sump, and a desiccant assembly mounted in said water separator sump and operative for receiving water contaminated solvent in said separator sump and discharging dry solvent from said desiccator assembly though said drain pipe to said boiling sump.

4,510,054

OIL RECOVERY APPARATUS

M. Martin Wylie, P.O. Box 271, Summerland, B.C., Canada V0H 1Z0

Filed Sep. 28, 1982, Ser. No. 425,793
Int. Cl.³ B01D 23/00; E02B 15/04
U.S. Cl. 210—242.3 16 Claims



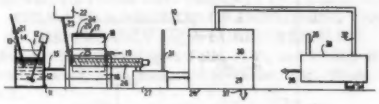
1. Apparatus for recovering oil from the surface of a body of water comprising: a collection unit; a separate recovery unit pivotally connected to said collection unit; and a pumping unit; said collection unit including generally vertically oriented wall means extending above and below the surface of the body of water for deflecting an oil/water mixture into a concentration area therein; said recovery unit including flotation tank means and a generally vertically oriented open-ended cylinder pivotally mounted to said flotation tank means and having a lower submerged portion; and said pumping unit including submerged conduit means leading from an inlet thereof maintained below the level of the oil on the surface of the water at said concentration area to an opening in the submerged portion of said cylinder and containing pump means therein operable to continuously draw a quantity of said oil/water mixture from said concentration area and to feed said quantity through said conduit means to the submerged portion of said cylinder, whereat oil rises to float and accumulate on the surface of water in said cylinder and uncontaminated water exits from the open lower portion of said cylinder.

4,510,055

FILTER AID

Harold R. White, New Lenox, Ill., assignor to Alar Engineering Corporation, Mokena, Ill.

Filed Aug. 25, 1981, Ser. No. 296,135
Int. Cl.³ B01D *39/04*
U.S. Cl. 210—500.1 6 Claims



1. A filter aid for rotary vacuum pre-coat filter units effective to maintain a filter bed coating on the rotating filter drum sufficiently porous to pass the liquid of a slurry while retaining the slurry solids thereon, capable of being scraped off the filter bed in thin film form with the slurry solids thereon, being sufficiently rigid to maintain the structural dimensions of the filter bed on the filter drum and capable of being incinerated with the solids of the slurry which comprises: rigid, granular non-fibrous combustible material having a dry bulk density of 0.3 to 0.6 grams per cubic centimeter, a particle density of from about 1.4 to 1.5 grams per cubic centimeter, a particle size of about 30 to about 125 microns.

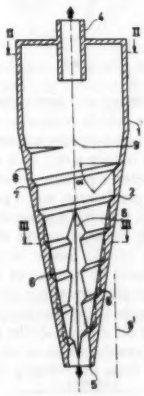
2. A filter aid comprising particles selected from the group consisting of charcoal and nut shells having a particle size of from 30 to 125 microns.

4,510,056

HYDROCYCLONE SEPARATOR

Rune H. Frykhult, Huddinge, and Lars-Goran Rundquist, Tumba, both of Sweden, assignors to AB Celleco, Stockholm, Sweden

Filed Nov. 30, 1982, Ser. No. 445,437
Claims priority, application Sweden, Dec. 4, 1981, 8107262
Int. Cl.³ B04C *5/103, 5/14*
U.S. Cl. 210—512.1 8 Claims



1. A hydrocyclone separator for separating a mixture into a light fraction of relatively low density and a heavy fraction of relatively high density, the separator comprising a housing forming a separation chamber having a circular cylindrical part located at an enlarged end portion of the housing and a conical part tapering from the cylindrical part, said cylindrical and conical parts having a substantially common axis, said cylindrical part having a tangential inlet for the feed mixture and also having an axial outlet for said light fraction, said conical part having a heavy fraction outlet located at a reduced end portion of the housing, said chamber having a wall along which a stream of said mixture is adapted to flow from said inlet toward said heavy fraction outlet, said tangential inlet being positioned to direct said stream in a first screw path along said wall while rotating in one direction about said axis, said wall having outside said heavy fraction outlet, and along a substantial part of said walls axial extent, means forming a second screw path opposite to said first screw path and thereby create turbulence in said stream as it flows along said first screw path.

4,510,057

ROTATING DISK BIOTREATMENT OF SYNGAS WASTE WATER

Edward H. Rowe, and Lloyd J. Parcell, both of Beaumont, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,867
Int. Cl.³ C02F *3/08*
U.S. Cl. 210—612 5 Claims

1. In a method for environmentally upgrading a waste water stream produced in the quench step of a process for the production of synthesis gas by reacting a carbonaceous fuel with an oxygen rich gas in a free flow, non catalytic synthesis gas generator at a temperature in the range of from a 1500° F. to 3000° F. and a pressure in the range of 1 to 250 atmospheres, the waste water stream being characterized by having toxic and corrosive properties due to the presence of 5 to 1,000 ppm cyanides, 100 to 20,000 ppm formates and 100 to 10,000 ppm ammonia, which method consists essentially of stripping ammonia and treating cyanides and formates with aerobic bacteria thereby degrading cyanides and formates and as a result environmentally upgrading the waste water stream; wherein the improvement comprises:

immobilizing the aerobic bacteria on a plurality of disks of a rotating disk contactor; positioning and rotating the disks relative to the waste water and air such that the immobilized bacteria are successively wetted with the waste water and exposed to air; rotating the disks at a velocity of 0.25 to 20 rpm; maintaining a waste water pH of 6 to 9.5, temperature of 5° C. to 40° C., residence time of 1 to 15 days and loading the disks with 0.3 to 0.7 lb BOD/(day-1000 ft.^{2}); thereby air stripping the ammonia and bacterially degrading the cyanides and formates.

4,510,058

METHOD FOR A NEW TYPE OF CHROMATOGRAPHY AND DEVICE THEREFOR

Michael Cais, and Moshe Shimoni, both of Haifa, Israel, assignors to Technion Research & Development Foundation, Ltd., Technion, Israel

Filed Jul. 29, 1983, Ser. No. 518,811
Claims priority, application Israel, Aug. 15, 1982, 66551
Int. Cl.³ B01D *15/08*
U.S. Cl. 210—657 26 Claims

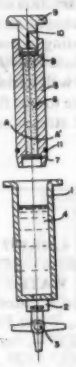
1. A method for separating separable components contained in a liquid sample, comprising the steps of

(a) adsorbing said separable components of said sample onto a movable chromatographic column comprising at least one dense-packed adsorbent bed, said column having an inlet end and on outlet end;

(b) placing said inlet end of said column into a container defining an elongated passage adapted to accept said column in a formfitting manner, said passage containing a predetermined amount of an eluant; and

(c) moving said column in said passage through said eluant,

whereby said eluant is forced under an intrinsic pressure developed in said passage through said adsorbent bed to



elute at least one of said separable components from said column at said outlet end.

4,510,059

CARBOXYLIC FUNCTIONAL POLYAMPHOLYTES AS SILICA POLYMERIZATION RETARDANTS AND DISPERSANTS

Zahid Amjad, West Lake, Ohio, and Monica A. Yorke, Coraopolis, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 411,182, Aug. 25, 1982, abandoned. This application Feb. 22, 1984, Ser. No. 582,403

Int. Cl.³ C02F *5/12*

U.S. Cl. 210—701 **2 Claims**

1. A method for reducing the formation of silica deposits in an aqueous system comprising adding to said aqueous system an effective amount of a carboxylic functional polyampholyte or the salt thereof, having an intrinsic viscosity of at least 1.0 dl/g. in 1.0M sodium chloride, prepared from 30 to 32.5 percent, by weight, of acrylic acid; 17.5 to 30 percent, by weight, of a cationic-containing monomer selected from the group consisting of dimethyldiallyl ammonium chloride, diethyldiallyl ammonium chloride and mixtures thereof; and 40 to 50 percent, by weight, acrylamide to retard polymerization of silica and reduce the formation of silica deposits in said aqueous system.

4,510,060

MEASUREMENT OF BS&W IN CRUDE OIL STREAMS

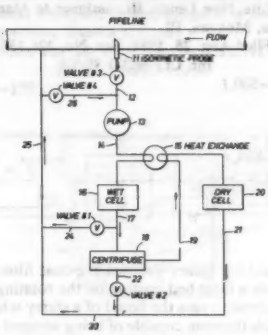
Thomas L. Stewart, Houston, and Florian C. Demny, Pasadena, both of Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Aug. 10, 1981, Ser. No. 291,597

Int. Cl.³ B01D *37/00*

U.S. Cl. 210—746 **5 Claims**

1. A process for measuring the water content of a wet stream which is predominantly non-aqueous, comprising, removing a sample of the wet stream, extracting a dry stream sample from the wet stream sample, heat exchanging the dry stream sample with the wet stream sample to reduce any temperature difference therebetween, and measuring the dielectric constants of



the wet stream sample and the dry stream sample to facilitate determining the water content of the wet stream.

4,510,061

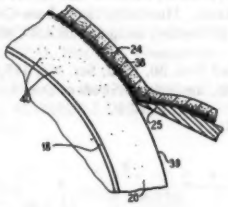
METHOD OF FILTERING

Harold R. White, New Lenox, Ill., assignor to Alar Engineering Corporation, Mokena, Ill.

Division of Ser. No. 296,135, Aug. 25, 1981,. This application Oct. 27, 1983, Ser. No. 546,184

Int. Cl.³ B01D *37/02*

U.S. Cl. 210—769 **6 Claims**



1. The method of filtering and recovering heat values from industrial waste slurries which comprises providing filter aid material selected from the group consisting of particulate charcoal and nut shells having a dry bulk density of 0.3 to 0.6 grams per cubic centimeter, a particle density of from about 1.4 to 1.5 grams per cubic centimeter, and a particle size of about 30 to about 125 microns, forming a pre-coat layer of said material on a rotating filter drum, rotating the pre-coated filter drum through a part of the waste slurry, sucking liquid through the drum to build up a layer of slurry solids on the drum, scraping the layer of slurry solids with a thin underlying film of the pre-coat layer from the periphery of the drum, incinerating the scraped off slurry and film layer to burn off the filter aid material and combustibles in the slurry solids, and recovering heat values from the burning step.

4,510,062

REFRIGERATION OIL COMPOSITION

Masayuki Nakanishi, Ichihara, Japan, assignor to Idemitsu Kosan Co., Ltd., Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,570

Claims priority, application Japan, May 12, 1983, 58-81722

Int. Cl.³ C10M *3/32, 1/38*

U.S. Cl. 252—45 **17 Claims**

1. A refrigeration oil composition comprising:
at least one oil selected from the group consisting of mineral

oils and synthetic oils, said oil having a viscosity of from 1 to 500 cSt at 40° C.; and

a mercaptan of the formula RSH, wherein R is an alkyl group having 14 to 20 carbon atoms, said mercaptan being in an amount of from 5 to 5000 ppm, based on said oil composition, as calculated in terms of sulfur.

4,510,063

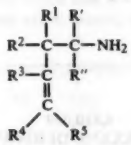
AMINE-POLYMER DISPERSANTS IN LUBRICATING OILS AND A METHOD OF IMPROVING THE DISPERSANCY OF A LUBRICATING OIL

Kechia J. Chou, Wappingers Falls, N.Y., and Phillip B. Valkovich, Spring, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 5, 1983, Ser. No. 510,486
Int. Cl.³ C10M *1/20, 1/32*
U.S. Cl. 252—51.5 R **24 Claims**

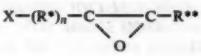
1. The method of improving the dispersancy of a lubricating oil which comprises adding to a major portion of a lubricating oil a minor dispersant amount of 0.01-10 w% of the reaction product at 50°-200° C. of substantially equivalent portions of

(i) a polymer containing carbon atoms in the backbone chain and characterized by the presence of at least one group of the formula



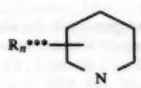
wherein R′ and R″ are hydrogen or alkyl, aralkyl, arlkaryl, aryl, or cycloalkyl hydrocarbon groups; and R^1, R^2, R^3, R^4, and R^5 are hydrogen or hydrocarbon groups, at least one of R^1 through R^5 being a portion of the polymer backbone; and

(ii) a haloepoxide



wherein X is halogen, R* is alkylene, alkarylene, aralkylene, cycloalkylene, or arylene; R** is selected from the same group as that from which R′ and R″ are selected, n is an integer ≧1; and

(iii) a tertiary heteroaromatic amine



wherein x is an integer 0–4 and R*** is hydrogen or alkyl, alkaryl, aralkyl, cycloalkyl, or aryl thereby forming product.

4,510,064

MIXTURE OF THREE REFRIGERANTS

Boris Ermak, Minneapolis, Minn., assignor to Robert D. Stevens, Chanhassen, Minn.

Filed Feb. 13, 1984, Ser. No. 579,486
Int. Cl.³ F25B *9/00*
U.S. Cl. 252—67 **11 Claims**

1. A refrigerant mixture consisting of Dichlorodifluoromethane (R12), Chlorodifluoromethane (R22) and Chlorodifluoroethane (R142b) in which said R142b is not in excess of 60% by weight of said mixture and said R12 and R22 are in ratios of about three parts to five parts respectively by weight of the 40% or more of the remaining weight of said mixture, the total of the three components being 100%.

4,510,065

SOFT CONTACT LENS PRESERVATIVE SYSTEM, PROPHYLACTIC CLEANER AND METHOD

Guy J. Sherman, Mandeville, La., assignor to Sherman Laboratories, Inc., Abita Springs, La.

Continuation-in-part of Ser. No. 384,110, Jun. 1, 1982, abandoned, which is a continuation-in-part of Ser. No. 53,758, Jul. 2, 1979, abandoned. This application Sep. 28, 1983, Ser. No. 537,257
Int. Cl.³ C11D *3/48, 1/72*
U.S. Cl. 252—106 **38 Claims**

1. A contact lens cleaning composition comprising:

(a) trimethoprim;

(b) a first adjuvant bactericide comprising ethylenediaminetetraacetic acid or a water soluble salt thereof and a second adjuvant bactericide selected from the group consisting of: sorbic acid; ascorbic acid; sodium ascorbate; calcium ascorbate; and mixtures thereof;

(c) at least one cleaning component suitable for cleaning contact lenses; and

(d) said trimethoprim and said first and second adjuvant bactericides present together in effective amounts for maintaining the sterility of the composition.

4,510,066

RETARDING SETTING OF CRUTCHER SLURRY FOR MANUFACTURING BASE BEADS FOR DETERGENT COMPOSITIONS

David C. Saar, Belle Mead, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed Jul. 6, 1983, Ser. No. 511,318
Int. Cl.³ C11D *3/04, 3/10, 3/12, 11/02*
U.S. Cl. 252—140 **9 Claims**

1. A process for retarding or preventing the setting of a miscible and pumpable crutcher slurry which is suitable for spray drying to base beads for a built nonionic detergent composition, which slurry comprises from 55 to 75% of solids and 45 to 25% of water, and comprises from 10 to 40% of a water softening zeolite, 30 to 50% of water soluble salt(s) selected from the group consisting of sodium bicarbonate, sodium carbonate, sodium sesquicarbonate, sodium sulfate and sodium silicate, and mixtures thereof, with the content of sodium silicate being no more than 2%, and 2 to 10% of a swelling bentonite, which comprises preparing a crutcher slurry which is of the described composition and which contains from 0.5 to 5% of magnesium sulfate, and 0% of citric material and mixing such composition in a crutcher during preparation thereof.

5. A miscible and pumpable crutcher slurry which is suitable for spray drying to base beads useful for the manufacture of a built nonionic detergent composition, which slurry comprises from 55 to 75% of solids and 45 to 25% of water and comprises from 10 to 40% of a water softening zeolite, 30 to 50% of water soluble salt(s) selected from the group consisting of sodium bicarbonate, sodium carbonate, sodium sesquicarbonate, sodium sulfate and sodium silicate, and mixtures thereof, with the content of sodium silicate being no more than 2%, 2 to 10% of a swelling bentonite, 0.5 to 5% of magnesium sulfate and 0% of citric material.

4,510,067

FOAM CONTROL COMPOSITION CONTAINING HIGH FOAMING NONIONIC SURFACTANT AND A POLYOXYALKYLENE COMPOUND

Ahmet C. Ozmeral, Baton Rouge, La., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Jun. 27, 1983, Ser. No. 508,159

Int. Cl.[3] **B01F** *17/16, 17/42;* **C10M** *1/20;* **C11D** *17/00*

U.S. Cl. 252—174.21 **9 Claims**

1. A composition comprising (a) a high-foaming, nonionic surfactant and (b) a foam-reducing amount of a polyoxyalkylene compound having the formula

$$Y[(A)_m—(B)_nH]_2$$

wherein Y is the residue formed by the removal of two atoms of active hydrogen from an initiator having a total of not more than 20 carbon atoms and free of elements other than carbon, hydrogen and oxygen, A is a hydrophobic, heteric mixture of an oxytetramethylene radical, derived from tetramethylene oxide and vicinal alkylene oxide radical derived from propylene oxide, said A being derived from the reaction of said oxides in the molar ratio of tetramethylene oxide:vicinal alkylene oxide of 3:1 to 1:1; B is C_2H_4O; m is an integer such that the total weight of said A is about 95 to 60 percent by weight of the total oxyalkylene residue weight of the compound; n is an integer such that the total weight of said B is about 5 to 40 percent by weight of the total oxyalkylene residue weight of the compound and the total molecular weight of the hydrophobe, 2 m is about 1000 to 3000.

4,510,068

N-(HYDROXY METHYL)-1-AMINO ALKANE-1,1-DIPHOSPHONIC ACIDS AS STABILIZING AGENTS IN PEROXIDE-CONTAINING BLEACHING BATHS

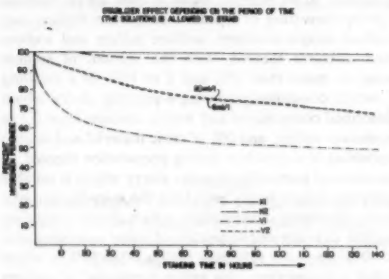
Hans-Adolf Rohlfs, Heidelberg; Alfred Kling, Ladenburg; Guenter Raab, Laudenbach; Michael Vogt, Moerlenbach; Viktor Specht, Dossenheim, and Ulrike Schaetzke, Weinheim-Sulzbach, all of Fed. Rep. of Germany, assignors to Benckiser-Knapsack GmbH, Landenburg am Neckar, Fed. Rep. of Germany

Division of Ser. No. 177,885, Aug. 14, 1980, Pat. No. 4,337,214. This application May 4, 1982, Ser. No. 374,683

Claims priority, application Fed. Rep. of Germany, Aug. 22, 1979, 2933969

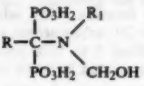
Int. Cl.[3] **C09K** *3/00;* **C07F** *9/38*

U.S. Cl. 252—186.29 **7 Claims**



1. A composition of matter for stabilizing a peroxide-containing alkaline bleaching liquor, said composition comprising:

an N-(hydroxy methyl)-1-amino alkane-1,1-diphosphonic acid corresponding to the formula



wherein R represents a methyl group, and R_1 represents hydrogen or the hydroxy methyl group ($—C_2OH$), and the water-soluble salts of said acid, and

at least one substance selected from the group consisting of alkali metal hydroxides, alkali metal persulfates, wetting agents, alkali metal gluconates, alkali metal borates, boric acid, and N,N-bis-(carboxy alkyl)-1-amino ethane-1,1-diphosphonic acids wherein the alkyl group contains 1 to 3 carbon atoms.

5. A composition of matter comprising an alkaline hydrogen peroxide-containing bleaching bath for bleaching cellulose fibers alone or blended with synthetic fibers, said bleaching bath containing, as a bleaching agent, an effective amount of hydrogen peroxide and, as a peroxide stabilizing agent, an N-(hydroxy methyl)-1-amino ethane-1,1-diphosphonic acid or an N,N-Bis-(hydroxy methyl)-1-amino ethane-1,1-diphosphonic acid as defined in claim 1, or a mixture thereof, in an amount between about 4% and about 30% of the amount of 35% hydrogen peroxide present in the bleaching bath.

4,510,069

CYCLOHEXANE DERIVATIVES

Rudolf Eidenschink, Dieburg; Günther Haas, Neckargemünd; Ludwig Pohl, Darmstadt; Michael Römer, Rodgau; Bernhard Scheuble, Alsbach, and Georg Weber, Erzhausen, all of Fed. Rep. of Germany, assignors to Merck Patent Gesellschaft mit beschränkter Haftung, Darmstadt, Fed. Rep. of Germany

Filed Aug. 26, 1983, Ser. No. 526,927

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1982, 3231707; Jun. 3, 1983, 3320024

Int. Cl.[3] **G02F** *1/13;* **C09K** *3/34;* **C07C** *121/46, 121/48, 121/64;* **C07D** *319/06*

U.S. Cl. 252—299.61 **18 Claims**

1. A liquid-crystal dielectric useful for electrooptical display elements and comprising at least two liquidcrystal components, wherein at least one of said components is a compound of the formula

$$R^1—(A^1)_m—Z^1—A—Z^2—(A^2)_n—R^2$$

wherein

R^1 and R^2 are each independently H; alkyl of 1–10 C atoms; alkyl of 1–10 C atoms in which one or two CH_2 groups is optionally replaced by 0 atoms; F; Cl; Br; CN; or —O—COR;

A^1 and A^2 are each independently 1,4-phenylene, 1,4-cyclohexylene, 1,3-dioxane-2,5-diyl, piperidine-1,4-diyl, 1,4-bicyclo(2,2,2)octylene or pyrimidine-2,5-diyl, each of which is unsubstituted or substituted by 1–4 F atoms;

A is 1,4-cyclohexylene which is substituted in the 1-position, the 4-position or the 1,4-positions by alkyl, alkoxy, fluorinated alkyl or fluorinated alkoxy, each of 1–5 C atoms, F, Cl, Br, CN or a combination thereof and which is optionally also substituted by 1 or 2 of F, Cl, Br or CN or a combination thereof;

Z^1 and Z^2 are each independently —CO—O, —O—CO—, $—CH_2CH_2—$, $—OCH_2—$, $—CH_2O$ or a single bond;

R is alkyl of 1–5 C atoms;

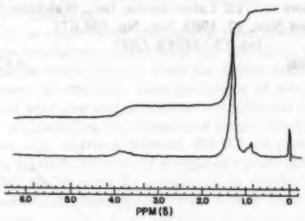
m is 1 or 2 and n is 0 or 1, wherein when m is 2, the two A^1 groups are identical or different from one another;

or an acid addition salt thereof for those compounds which are basic.

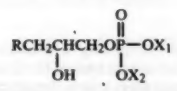
4,510,070
EMULSIFYING COMPOSITION

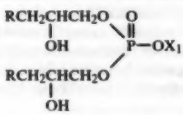
Hisao Tsutsumi, Miyashiro, and Tomoko Inoue, Yokohama, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Nov. 22, 1982, Ser. No. 443,640
Claims priority, application Japan, Mar. 29, 1982, 57-49180
Int. Cl.³ C11D 3/36
U.S. Cl. 252—351 14 Claims



1. An emulsifying composition comprising one or more of hydroxyalkyl or hydroxyalkenyl phosphates represented by the general formula (I) and/or (II)


(I)


(II)

in which R may be the same or different and represent an alkyl or alkenyl group having 5–21 carbon atoms, X_1 and X_2 independently represent a pair ion selected from the group consisting of hydrogen, alkali metal, ammonium, alkylammonium whose alkyl group has 1–5 carbon atoms, and alkanolamine which has a hydroxyalkyl group having 2 or 3 carbon atoms.

4,510,071
METHANOL CONVERSION PROCESS

Richard W. Joyner, Lightwater; John J. McCarroll, Camberley, and Stephen R. Tennison, Weybridge, all of England, assignors to The British Petroleum Company p.l.c., London, England

Filed Aug. 1, 1984, Ser. No. 636,570
Claims priority, application United Kingdom, Aug. 6, 1983, 8321255
Int. Cl.³ C01B 3/22
U.S. Cl. 252—373 9 Claims

1. A process for the conversion of methanol to a mixture of carbon monoxide and hydrogen by passing methanol over a catalyst under conditions such that the concentration of methanol in the feed is higher than the concentration of methanol in the product, which process is characterised in that the catalyst contains palladium metal dispersed on a support and a promoter which is an alkali metal, alkaline earth metal, or a lanthanide, and the support is a graphite-containing carbon having

(a) a basal plane surface area of at least 100 m^2/g
(b) a ratio of BET surface area to basal plane surface area of not more than 5:1
(c) a ratio of basal plane surface area to edge surface area of at least 10:1.

4,510,072
COMPOSITION HAVING NEUTRALIZED DIFFERENTIAL INFRARED ABSORBENCY

Randall S. Young, Lafayette, and Ronald D. Fredericks, Jr., Oakland, both of Calif., assignors to Dairy & Food Labs, Inc., San Francisco, Calif.

Filed Jan. 28, 1983, Ser. No. 461,720
Int. Cl.³ C09K 3/00
U.S. Cl. 252—380 7 Claims

6. A preservative composition for adding to milk samples which will be subjected to infrared absorbence testing, said testing comprising:

measuring the relative absorbence of the sample at a first pair of wavelengths to determine fat content;
measuring the relative absorbence of the sample at a second pair of wavelengths to determine protein content; and
measuring the relative absorbence of the sample of a third pair of wavelengths to determine lactose content;
said composition comprising:
one or more components, including a biocide, which together exhibit differing absorbencies at each wavelength in the three pairs of wavelengths;
a first compensating component having absorbency characteristics and present in an amount so that the total increase in absorbency observed at both wavelengths of the first pair of wavelengths is substantially equal;
a second compensating component having absorbency characteristics and present in an amount so that the total increase in absorbency observed at both wavelengths of the second pair of wavelengths is substantially equal; and
a third compensating component having absorbency characteristics are present in an amount so that the total increase in absorbency observed at both wavelengths of the third pair of wavelengths is substantially equal.

4,510,073
METHOD FOR GRANULATING CATIONIC SURFACTANT

Noboru Hara, Tokyo; Shinichi Fukudome, Chiba; Nobuo Johna, Funabashi, and Masayoshi Nakamura, Chiba, all of Japan, assignors to Lion Corporation, Tokyo, Japan

Filed Jul. 1, 1983, Ser. No. 510,243
Claims priority, application Japan, Jul. 5, 1982, 57-116594; May 24, 1983, 58-91370
Int. Cl.³ A23L 1/00
U.S. Cl. 252—383 4 Claims

1. A method for granulating a cationic surfactant having good water dispersibility comprising the steps of:

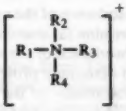
(i) mixing 100 parts by weight of a powdered di (long-chain alkyl) quaternary ammonium salt having an average particle diameter of 150 μm or less with 10 to 30 parts by weight of finely divided silica having an average primary particle diameter of 0.1 μm or less;
(ii) adding 20 to 80 parts by weight of a self-adhesive substance to the resultant mixture in the step (i), followed by granulation; and
(iii) adding 30 to 150 parts by weight of at least one member selected from the group consisting of finely divided zeolite having an average primary particle diameter of 0.1 to 10 μm, finely divided calcium carbonate having an average primary particle diameter of 0.01 to 10 μm, and a mixture thereof, followed by granulation.

4,510,074
WOOD PRESERVATIVE COMPOSITION

Ryozo Nakai; Shigeo Inoue, both of Utsunomiya, and Sumio Arai, Yokohama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

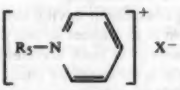
Filed Apr. 6, 1983, Ser. No. 482,440
Claims priority, application Japan, Apr. 30, 1982, 57-72962
Int. Cl.³ C09K *15/32, 15/22, 15/16;* B05D *1/18*
U.S. Cl. 252—400.23 20 Claims

1. A wood preservative composition comprising:
(A) an alkyl ammonium compound of the formula (I):



(I)

or a mixture thereof; and
(B) a polyacid salt of the formula II;



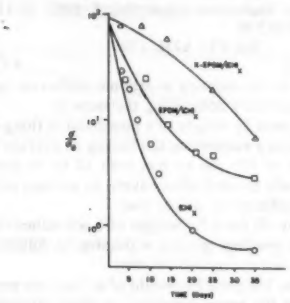
(II)

or a mixture thereof; as aqueous solution thereof, wherein:
R_1 represents an alkyl or alkenyl group of 8–20 carbon atoms,
R_2 and R_3 individually represent a hydrogen atom, an alkyl group of 1–5 carbon atoms, a hydroxyalkyl group of 1–5 carbon atoms or an aralkyl group, or R_2 and R_3 may be joined to form a ring containing a hetero-atom together with an adjacent nitrogen atom,
R_4 represents a hydrogen atom or an alkyl group of 1–20 carbon atoms,
R_5 represents an alkyl or alkenyl group of 8–20 carbon atoms, and
X represents a radical of an organic or inorganic acid.

4,510,075
ELECTRICALLY CONDUCTIVE BLENDS OF AN ACETYLENE POLYMER AND AN ELASTOMER HAVING LOW UNSATURATION

Kang I. Lee, Framingham, and Harriet Jopson, Dover, both of Mass., assignors to GTE Laboratories, Inc., Waltham, Mass.

Filed Nov. 23, 1983, Ser. No. 554,610
Int. Cl.³ H01B *1/00*
U.S. Cl. 252—500 6 Claims

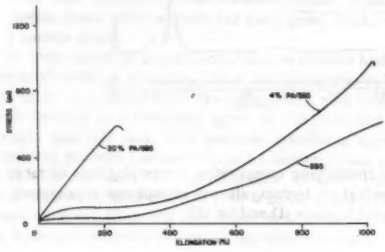


1. An electrically conductive polymer blend comprising a doped acetylene polymer dispersed within an elastomer having a low level of unsaturation, said elastomer comprising a copolymer of a monoethylenically unsaturated monomer with a diene.

4,510,076
ELECTRICALLY CONDUCTIVE POLYMER BLENDS OF AN ACETYLENE POLYMER AND A TRIBLOCK THERMOPLASTIC ELASTOMER

Kang I. Lee, Framingham, and Harriet Jopson, Weston, both of Mass., assignors to GTE Laboratories, Inc., Waltham, Mass.

Filed Nov. 23, 1983, Ser. No. 554,671
Int. Cl.³ H01B *1/00*
U.S. Cl. 252—500 6 Claims



1. A polymer blend comprising a triblock thermoplastic elastomer having an elastomeric central block and glassy outer blocks with a conjugated acetylene polymer dispersed within the central block of said triblock thermoplastic elastomer, said conjugated acetylene polymer being present in a sufficient amount and doped with an electron doner or an electron acceptor to a sufficient level to provide said polymer blend with an electrical conductivity of at least about $10^{-6}ohm^{-1}cm^{-1}$.

4,510,077
SEMICONDUCTIVE GLASS FIBERS AND METHOD

Richard K. Elton, Altamont, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 3, 1983, Ser. No. 548,338
Int. Cl.³ H01B *1/06, 5/02*
U.S. Cl. 252—502 27 Claims

1. A semiconductive material comprising glass fibers which are pyrolyzed in the substantial absence of oxygen in the presence of an effective amount of an organic compound to render said glass fibers semiconducting by forming carbon deposited glass fibers.

12. A process for producing a semiconductive material, comprising:
(a) depositing an effective amount of an organic compound on glass fibers;
(b) pyrolyzing the glass fibers and organic compound deposited thereon at a temperature of at least 600° C. in the substantial absence of oxygen to form carbon deposited glass fibers.

4,510,078
OILED, ELECTRICALLY CONDUCTIVE CARBON BLACK

Aspy K. Mehta, Baton Rouge, La., assignor to Union Carbide Corp., Danbury, Conn.

Division of Ser. No. 221,153, Dec. 29, 1980,. This application Aug. 15, 1983, Ser. No. 523,277
Int. Cl.³ H01B *1/06*
U.S. Cl. 252—510 1 Claim

1. Carbon black having a surface area of about 1000 m^2/gram oiled with a white mineral oil of lubricating viscosity, by admixing said carbon black with said white mineral oil in a weight ratio of carbon black to oil of about 3:1 to about 1:1.

4,510,079

ELECTRICALLY-CONDUCTIVE RESIN COMPOSITION

Yoichi Kawai; Yoshihisa Gotoh, and Sachio Yokote, all of Yokohama; Masami Maki, Kawasaki; Kalsumi Sekiguchi, Yokohama, all of Japan, assignors to Mitsui Toatsu Chemicals, Inc., Japan

Filed Apr. 7, 1982, Ser. No. 366,208
Claims priority, application Japan, Apr. 13, 1981, 56-54340
Int. Cl.[3] H01B *1/06*
U.S. Cl. 252—511 2 Claims

1. In an electrically conductive resin composition, suitable for electroplating, comprising (a) 100 parts by weight of a polyolefin resin selected from the group consisting of homopolymers of ethylene, homopolymers of propylene, copolymers of ethylene and propylene, copolymers of ethylene with other alphaolefins, copolymers of propylene with other alphaolefins, and mixtures thereof, (b) 0.1–10 parts by weight of sulfur, (c) 0.05–10 parts by weight of a plate adhesion promoter and (d) 10–70 parts by weight of an electrically conductive carbon black, the improvement which comprises adding to said composition a flow improver in an amount of 4–40 parts by weight per 100 parts by weight of (a) plus (d), said flow improver being selected from the group consisting of a softening agent derived from petroleum, a polyalkylene glycol and mixtures thereof, said softening agent being derived from petroleum which consists of naphthenic process oil, aromatic process oil, paraffinic process oil or liquid paraffin, said polyalkylene glycol having alkylene radicals of 1 to 4 carbon atoms.

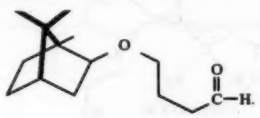
4,510,080

ORGANOLEPTIC USES OF HYDROCARBYLOXY ALKANALS

Richard M. Boden, Ocean; William L. Schreiber, Jackson; Futoshi Fujioka, Wanamassa, all of N.J.; Patrick Chant, Brooklyn, N.Y., and Lambert Dekker, Wyckoff, N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 366,079, Apr. 6, 1982, Pat. No. 4,443,633. This application Sep. 26, 1983, Ser. No. 535,930
Int. Cl.[3] A01K *7/46;* C11D *17/00*
U.S. Cl. 252—522 R 5 Claims

1. A process for augmenting or enhancing the aroma of a consumable material selected from the group consisting of perfume compositions, colognes, perfumed polymers, solid or liquid anionic, cationic nonionic or zwitterionic detergents, and fabric softener compositions or fabric sofener articles comprising the step of adding to a said consumable material an aroma augmenting or enhancing quantity of the norbornyl oxybutyraldehyde having the structure:



4,510,081

DRIFT CONTROL CONCENTRATE

James A. Bronner, Glendale; John D. Moore, Los Angeles, and Paul R. Dale, La Crescenta, all of Calif., assignors to Sanitek Products, Inc., Los Angeles, Calif.

Continuation-in-part of Ser. No. 298,249, Aug. 31, 1981,. This application Feb. 15, 1983, Ser. No. 466,592
Int. Cl.[3] C09K *3/28*
U.S. Cl. 252—603 6 Claims

1. A drift control concentrate admixed with an aqueous fire retardant preparation for application to vegetation or soil by aerial spraying or discharge and characterized by the admixture's ability to remain effective when made with hard or brackish water, by the admixture's ability not to clog spray nozzles, and by the concentrate's relative ease of solution into aqueous preparations, said concentrate consisting essentially of a mixture of effective amounts of a water soluble polymer, or mixtures of said polymer, which will increase the viscosity and thicken said aqueous preparation, and effective amounts of a water soluble polymer, or mixtures thereof, which will impart viscoelasticity to said aqueous preparation, wherein said viscoelasticity increasing polymer is selected from the group consisting of:

(a) Polyacrylamides or their copolymers or derivatives,
(b) Polymers and copolymers of acrylic acid and methacrylic acid or their salts,
(c) Polymethacrylamides or their copolymers or derivatives,
(d) Polyacrylonitriles, their hydrolysis products, copolymers, or derivatives; and
(e) Polymers of ethylene or alkylene oxide.

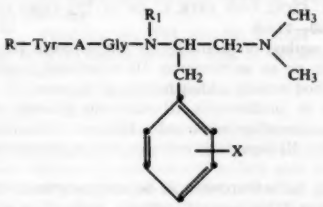
4,510,082

PHARMACOLOGICALLY ACTIVE PEPTIDES

Paul D. Gesellchen, Indianapolis, and Robert T. Shuman, Greenwood, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 7, 1983, Ser. No. 472,438
Int. Cl.[3] C07C *103/52*
U.S. Cl. 260—112.5 R 18 Claims

1. A compound of the formula



and pharmaceutically acceptable non-toxic acid addition salts thereof, in which

R is hydrogen, methyl, ethyl, cyclopropylmethyl, or allyl;
A is a residue of a D-amino acid selected from the group consisting of Ala, Abu, Nva, Val, Nle, Leu, Ile, Gly(Al), Gly(Cp), Met, Cys(Me), Met(O), Cys(Me) (O), Ser Ser(Me), Thr, and Hse;
R_1 is hydrogen, C_1–C_3 primary alkyl, cyclopropylmethyl, allyl, ethylthiometryl, 2-fluoroethyl, or propargyl; and
X is hydrogen fluoro, bromo, iodo, chloro, hydroxy, C_1–C_3 alkyl, trifluoromethyl, or C_1–C_2 alkoxy.

4,510,083

PROCESS FOR PREPARING POLYPEPTIDES

Thomas J. Blacklock, Clark, and Richard F. Shuman, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 375,859, May 7, 1982, abandoned. This application May 31, 1983, Ser. No. 499,743
Int. Cl.[3] C07C *103/52*
U.S. Cl. 260—112.5 R 4 Claims

1. A process for sequentially producing polypeptides comprising:

(a) preparing a solvent system containing an amino acid or a peptide and an alkali metal carbonate, said alkali metal being selected from the group consisting of potassium, rubidium, and cesium; said amino acid or peptide being selected from the group consisting of alanine, arginine, asparagine, aspartic acid, cysteine, cystine, glutamic acid, glutamine, glycine, histidine, isoleucine, leucine, lysine, methionine, ornithine, phenylalanine, proline, serine, threonine, tyrptophan, tyrosine, valine, and admixtures and combinations thereof; and, said solvent system comprises only water or water and an aprotic organic co-solvent selected from the group consisting of acetonitrile, tetrahy-

drofuran, ethyl acetate, dimethylformamide, or combinations thereof;
(b) maintaining the temperature of said solvent system at about −10° to 10° C.;
(c) rapidly adding to said solvent system a solution of an amino acid N-carboxyanhydride (NCA) to form a reaction mixture, said amino acid being selected from those defined in (a) above and the excess molar concentration of said NCA, peptide, or amino acid in said reaction mixture being less than about 5%;
(d) stirring said reaction mixture for no more than about 10 minutes or until the reaction is complete; and,
(e) recovering the coupled reaction polypeptide product from said reaction mixture.

4,510,084

METHOD OF PRODUCING AN ANTITHROMBIN III-HEPARIN CONCENTRATE OR ANTITHROMBIN III-HEPARINOID CONCENTRATE

Johann Eibl; Ernst Hetzl, and Yendra Linnau, all of Vienna, Austria, assignors to Immuno Aktiengesellschaft für chemisch-medizinische Produkte, Vienna, Austria

Filed May 18, 1984, Ser. No. 611,639
Claims priority, application Austria, May 20, 1983, 1859/83
Int. Cl.[3] **C07G** *7/00;* **A61K** *37/64, 31/725;* **C08B** *37/10*
U.S. Cl. 260—112 B **12 Claims**

1. In a method of producing an antithrombin III-heparin concentrate or an antithrombin III-heparinoid concentrate, which method includes adding heparin or heparinoid to human plasma or to antithrombin III-containing plasma fractions under formation of an antithrombin III-heparin complex or an antithrombin III-heparinoid complex, the improvement comprising

adsorbing the antithrombin III-heparin complex or the antithrombin III-heparinoid complex formed on an anion exchanger thus forming an adsorbate,

eluting said adsorbate with a salt solution thus forming an eluate,

separating said antithrombin III-heparin or antithrombin III-heparinoid complex contained in said eluate from salts and undesired proteins, and

lyophilizing the resulting product so as to bring it into stable form.

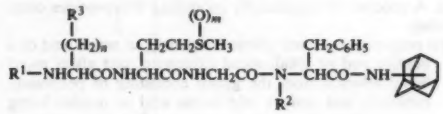
4,510,085

ANTIHYPERTENSIVE TETRAPEPTIDE AMIDES

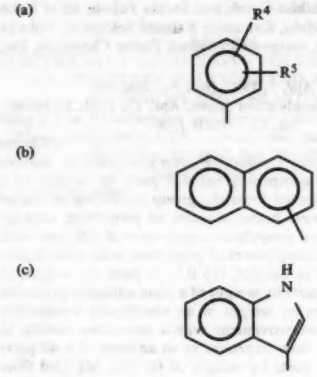
Donald W. Hansen, Jr., Chicago, and Stamatios Papaioannou, Morton Grove, both of Ill., assignors to G.D. Searle & Co., Skokie, Ill.

Filed Apr. 12, 1984, Ser. No. 599,313
Int. Cl.[3] **C07C** *103/52*
U.S. Cl. 260—112.5 E **40 Claims**

1. A compound of the formula:



wherein R^1 is:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive;
wherein R^2 is:
(a) hydrogen; or
(b) alkyl of 1 to 6 carbon atoms, inclusive;
wherein R^3 is:



wherein R^4 and R^5, each being the same or different, are:
(a) hydrogen;
(b) alkyl of 1 to 6 carbon atoms, inclusive; or
(c) halogen;
wherein m is 0, 1, or 2;
wherein n is 0 or an integer of from 1 to 4; and the stereochemical configuration of each of the optically active amino acid residues may independently be D, l, or DL; and the pharmaceutically acceptable salts thereof.

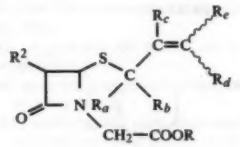
4,510,086

2(4-ALLYLTHIOAZETIDIN-2-ON-1-YL)ACETIC ACID ESTER COMPOUNDS

Barry C. Ross, Luton; Graham Johnson, Milton Keynes, both of England, and Michael A. Yeomans, Liederbach, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 318,113, Nov. 4, 1981, Pat. No. 4,474,793. This application Aug. 22, 1983, Ser. No. 524,973
Claims priority, application United Kingdom, Nov. 6, 1980, 8035657
Int. Cl.[3] **C07D** *205/08, 513/04*
U.S. Cl. 260—239 A **1 Claim**

1. A compound of the formula

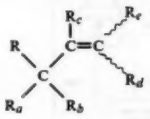


wherein
R is a carboxyl esterifying group removable by hydrolysis, photolysis, reduction, or enzyme action without substantial degradation of the rest of the molecule to give the free acid;
R^2 is hydrogen, lower alkyl, lower alkoxyalkyl, lower alkanoyloxyalkyl, or tri-lower alkylsilyloxyalkyl;
R_a, R_b, R_c, R_d, and R_e, taken alone, are the same or different and are hydrogen, alkyl or alkenyl having up to 8 carbon atoms, cycloalkyl or cycloalkenyl having up to 18 carbon atoms, halogen, cyano, carboxyl, or carboxyl esterified with an unsubstituted aliphatic alcohol having up to 20 carbon atoms;
any two of R_a, R_b, R_c, R_d, and R_e, taken together with the carbon atom or atoms to which they are attached, may form a cycloaliphatic ring having 3 to 10 carbon atoms,

said compound having none, one, or two of such rings present therein;

R_c is cis or trans with respect to R_d; and

R^2 is cis or trans with respect to



4,510,087

PROCESS FOR PRODUCING 1,4-DIAMINOANTHRAQUINONE-2-SULFONIC ACID

Makoto Hattori, Osaka; Akihiro Taguma, Hyogo, and Akira Takeshita, Osaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Jul. 27, 1983, Ser. No. 518,177

Claims priority, application Japan, Aug. 4, 1982, 57-136484

Int. Cl.[3] C07C *143/665*

U.S. Cl. 260—371 6 Claims

1. A process for producing 1,4-diaminoanthraquinone-2-sulfonic acid or a salt thereof comprising reacting 1-amino-4-bromoanthraquinone-2-sulfonic acid or a salt thereof with liquid ammonia in the presence of a copper catalyst, wherein the reaction is carried out in the presence of an inert organic solvent selected from the group consisting of a paraffinic saturated hydrocarbon, a naphthenic saturated hydrocarbon, and a mixture thereof.

4,510,088

DYE MIXTURES OF ANTHRAQUINONE DYES

Peter Möckli, Schönenbuch, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

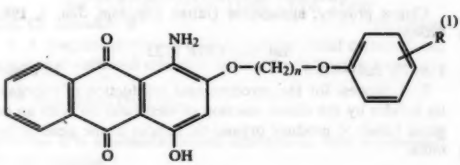
Filed Aug. 18, 1982, Ser. No. 409,211

Claims priority, application Switzerland, Aug. 28, 1981, 5544/81

Int. Cl.[3] C07C *97/26;* C09B *5/62*

U.S. Cl. 260—380 9 Claims

1. A dye mixture consisting of at least two dyes of the formula (1)



(1)

wherein R is hydrogen, methyl or ethyl, and n is an integer from 2 to 4.

4,510,089

OCTAHYDROTETRACYANOQUINODIMETHANE AND DERIVATIVES THEREOF

Shu Hotta, Hirakata; Tomiharu Hosaka, Yawata, and Wataru Shimotsuma, Ibaraki, all of Japan, assignors to Matsushita Electric Industrial Company, Limited, Japan

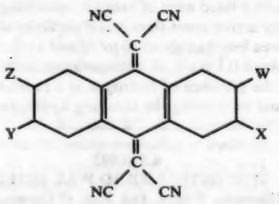
Filed Jun. 8, 1982, Ser. No. 386,790

Claims priority, application Japan, Jun. 12, 1981, 56-91171; Jun. 12, 1981, 56-91172

Int. Cl.[3] C07C *50/00*

U.S. Cl. 260—396 N 7 Claims

1. A compound of the general formula



in which W, X, Y and Z independently represent hydrogen, halogen, hydroxyl group, hydrocarbon group having 1 to 8 carbon atoms, alkoxy group having 1 to 8 carbon atoms or acyloxy group having 1 to 8 carbon atoms provided that W=Y and X=Z or W=Z and X=Y.

4,510,090

METHOD FOR THE PRODUCTION OF PHENANTHRENEQUINONE

Dietrich Tonnius, Mannheim; Wolfgang Weiss, Neckarhausen; Winfried Orth, Hassloch; Heinrich Miele, Weinheim, and Emmerich Pastorek, Hemsbach, all of Fed. Rep. of Germany, assignors to Rütgerswerke Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Jan. 30, 1984, Ser. No. 575,128

Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305528

Int. Cl.[3] C07C *50/16*

U.S. Cl. 260—396 R 4 Claims

1. Method for the production of 9,10-phenanthrenequinone by oxidizing phenanthrene with the aid of chromic acid and by controlled addition of concentrated sulfuric acid to a mixture of phenanthrene suspended in water and alkali dichromate, comprising the steps of preparing a dispersion of phenanthrene, alkali dichromate and water at 95°–100° C., cooling said dispersion down to 80° to 85° C. and carrying out the oxidation reaction under cooling and controlled addition of concentrated sulfuric acid in a temperature range from 80° to 85° C.

4,510,091

CONTINUOUS REDUCTION OF EDIBLE OILS

Bruce I. Rosen, Skokie, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 19, 1982, Ser. No. 360,071

The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.

Int. Cl.[3] C11C *3/12*

U.S. Cl. 260—409 13 Claims

1. A continuous method for the selective hydrogenation of a fatty material which comprises contacting an upwardly flowing mass of the fatty material at a temperature from about 150° to about 250° C. in the presence of hydrogen at a pressure up to about 150 psig with a fixed mass of catalyst consisting essentially of catalytically active zerovalent nickel on alpha-alumina having a surface area less than about 10 m^2/g and a micropore volume less than about 0.1 ml/g, and recovering the resultant hydrogenated product.

4,510,092

CONTINUOUS REDUCTION OF EDIBLE OILS

Bruce I. Rosen, Skokie, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Mar. 19, 1982, Ser. No. 360,114

The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.

Int. Cl.[3] C11C *3/12*

U.S. Cl. 260—409 11 Claims

1. A method of selectively hydrogenating fatty materials

continuously comprising contacting a flowing mass of a fatty material with a fixed mass of catalyst, consisting essentially of catalytically active zerovalent nickel on alpha-alumina having a surface area less than about 10 m^2/g and a micropore volume less than about 0.1 ml/g, at a temperature from about 150° to 250° C. in the presence of hydrogen at a pressure up to about 150 psig, and recovering the resulting hydrogenated product.

4,510,093

SYNTHETIC LIQUID WAX ESTERS

Hans L. Hülsmann, Wetter, Fed. Rep. of Germany, assignor to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,457

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208930

Int. Cl.³ C11C *3/02*

U.S. Cl. 260—410.9 N **9 Claims**

1. A synthetic liquid wax ester substitute for jojoba oil, consisting essentially of ester mixtures of substantially equivalent amounts of an unsaturated carboxylic acid component (a) and an unsaturated alcohol component (b) wherein

(a) is a mixture of a_1, a_2 and a_3 wherein

a_1=straight-chain fatty acids including

5 to 95% monounsaturated C22 fatty acids,

0 to 10% monounsaturated C20 fatty acids,

0 to 60% monounsaturated C18 fatty acids,

0 to 25% diunsaturated C18 fatty acids, and

0 to 8% triunsaturated C18 fatty acids;

a_2=0 to 25% addition products of acrylic acid onto conjugated diunsaturated fatty acids; and

a_3=0 to 25% dimeric fatty acids; and

(b) is a mixture of 0 to 10% unsaturated C12 fatty alcohols

0 to 15% unsaturated C14 fatty alcohols,

0 to 40% unsaturated C16 fatty alcohols,

50 to 95% unsaturated C18 fatty alcohols,

0 to 10% unsaturated C20 fatty alcohols, and

0 to 10% unsaturated C22 fatty alcohols;

wherein all components of (a) and (b) total 100% in each case.

4,510,094

PLATINUM COMPLEX

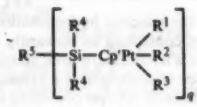
Timothy J. Drahnak, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 6, 1983, Ser. No. 558,617

Int. Cl.³ C07F *17/02*

U.S. Cl. 260—429 CY **2 Claims**

1. A platinum complex having the formula

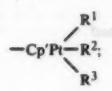


wherein

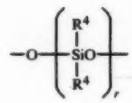
Cp' represents a cyclopentadienyl group that is eta-bonded to the platinum atom and is also bonded to the silicon atom of an organosilyl group;

each of R^1, R^2, and R^3 represents an aliphatic group having from one to eighteen carbon atoms, said R^1, R^2, and R^3 groups being sigma-bonded to the platinum atom

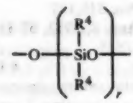
each R^4 can be the same or different and represents a monovalent hydrocarbyl group selected from the group consisting of saturated linear aliphatic groups having 1 to 18 carbon atoms, saturated branched aliphatic groups having 3 to 18 carbon atoms, alicyclic groups having 4 to 18 carbon atoms, aryl groups having 6 to 14 carbon atoms, and



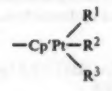
R^5 is R^4 or



where r is zero or an integer of 1 to 100; and q is one or two, with the proviso that when q is one, R^5 is R^4, and when q is two, R^5 is



and that in the complex no more than 50% of the R^4 groups are



groups.

4,510,095

PRODUCTION OF ORGANOTIN HALIDES

Frank S. Holland, Hazel Grove; Peter Womersley, Heaton Mersey, and John Curran, Clayton, all of England, assignors to Manchem Limited, Manchester, England

Filed Jan. 6, 1983, Ser. No. 456,316

Claims priority, application United Kingdom, Jan. 7, 1982, 8200353

Int. Cl.³ C07F *7/22*

U.S. Cl. 260—429.7 **16 Claims**

1. A process for the prredominant production of triorgano tin halides by the direct reaction of elemental tin with an organic halide to produce organo tin halides of the general formula:

$$R_aSnX_{(4-a)}$$

wherein

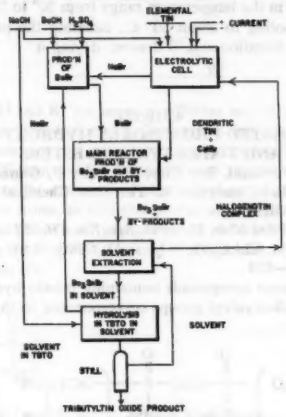
each R independently represents a hydrocarbyl radical covalently bonded to tin;

each X independently represents any chloride, bromide or iodide; and

a may be a number from 1 to 3, but in the majority is 3;

which process comprises reacting an organic halide of the formula RX added during the course of the reaction with a molar excess, relative thereto, of elemental tin in the presence of a reagent amount of an 'onium compound at an elevated temperature sufficient to maintain the same in the liquid state, while also maintaining the weight and molar concentration of said 'onium compound relative to said RX throughout the reaction period at a molar ratio of at least 1:5, whereby there is

obtained an organo tin halide product having R_3SnX as the molar predominant molecular species, while also forming as a



by-product a water-insoluble halogeno tin complex with the 'onium cation.

4,510,096

MAGNESIUM GROUP VIII TRANSITION METAL CARBONYL COMPLEX

Gary B. McVicker, Westfield, N.J., assignor to Exxon Research and Engineering Company, Florham Park, N.J.

Division of Ser. No. 139,151, Apr. 11, 1980, Pat. No. 4,321,211, which is a division of Ser. No. 17,717, Mar. 5, 1979, abandoned, which is a division of Ser. No. 779,589, May 24, 1977, abandoned, which is a continuation-in-part of Ser. No. 166,615, Jul. 27, 1971, abandoned, which is a continuation-in-part of Ser. No. 51,669, Jul. 1, 1970, abandoned. This application Jan. 4, 1982, Ser. No. 336,577

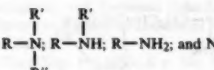
Int. Cl.³ C07F *15/02, 15/04, 15/06, 15/00*

U.S. Cl. 260—439 R **10 Claims**

1. A magnesium Group VIII transition metal carbonyl and substituted carbonyl complex having the following formula:

$$B_xMe[Me'(CO)_a(L)_b]_2$$

wherein B is a monofunctional nitrogenous base represented by the formulae:

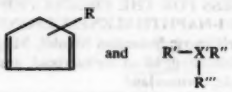


wherein R, R' and R'' are hydrocarbyl radicals independently selected from the group consisting of C_1 to C_{10} alkyl, C_3 to C_{10} cycloalkyl, C_6 to C_{10} aryl and C_7 to C_{10} alkaryl and radicals;

Me is magnesium;

Me' is a transition metal selected from the group consisting of the metals of Group VIII of the Periodic Table of the Elements;

L is a uni- or polydentate ligand or hydrocarbon residue which is selected from the group consisting of compounds of the following general formula:



wherein R, R', R'' and R''' are radicals independently selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_3 to C_{20} cycloalkyl, C_6 to C_{20} aryl, C_7 to C_{20} aralkyl and alkaryl, and X is selected from the group consisting of N, P, As and Sb;

a is an integer ranging from 1 to 4;

b is an integer ranging from 0 to 3, with the proviso that the sum of a and b is 5 or less.

4,510,097

HINDERED ALIPHATIC MONOISOCYANATES

Clifton L. Kehr, Silver Spring; Walter R. Wszolek, Sykesville, and Nelson S. Marans, Silver Spring, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Nov. 20, 1978, Ser. No. 962,543

Int. Cl.³ C07C *119/045*

U.S. Cl. 260—453 A **1 Claim**

1. 2,6-diethylcyclohexylisocyanate.

4,510,098

INSECTICIDAL PRODUCT

John Crosby, Cheshire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 26, 1983, Ser. No. 535,624

Claims priority, application United Kingdom, Mar. 28, 1983, 8308507

Int. Cl.³ C07C *121/75*

U.S. Cl. 260—465 D **5 Claims**

1. The enantiomeric pair of isomers represented by (S)-α-cyano-3-phenoxybenzyl 1R,cis-3-(Z-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate and (R)-α-cyano-3-phenoxybenzyl 1S,cis-3-(Z-2-chloro-3,3,3-trifluoroprop-1-en-yl)-2,2-dimethylcyclopropane carboxylate in racemic proportions and substantially free from any other isomer of α-cyano-3-phenoxybenzyl 3-(2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate in crystalline form having a melting point greater than 47° C.

4,510,099

PROCESS FOR PREPARING PURE DIACETONITRILE

Gerhard Stern, Linz, Austria, assignor to Chemie Linz Aktiengesellschaft, Linz, Austria

Filed Aug. 15, 1983, Ser. No. 523,623

Claims priority, application Fed. Rep. of Germany, Aug. 20, 1982, 3231052

Int. Cl.³ C07C *121/45*

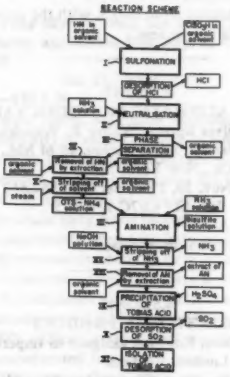
U.S. Cl. 260—465.5 R **6 Claims**

1. A process for preparing pure diacetonitrile, which comprises reacting acetonitrile with molten sodium at a temperature of 97° to 140° C. and under a pressure of 1 to 10 bar in an inert organic medium which is liquid under the reaction conditions, until the reaction is substantially complete, cooling down the mixture to 0°-50° C., hydrolyzing the sodium salt formed by adding water in an amount which is sufficient to dissolve all of the sodium hydroxide and sodium cyanide formed in the hydrolysis, to form a three-phase system from which the aqueous phase and the inert organic medium are separated off, admixing the remaining, third, middle phase, which is crude, liquid diacetonitrile, with 0.5 to 3 times the amount of water, and cooling the mixture down to −10° C. to +30° C., whereupon pure diacetonitrile crystallizes out of the cold mixture and is separated off.

4,510,100
PROCESS FOR THE PRODUCTION OF 2-AMINO-1-NAPHTHALENESULFONIC ACID

Eric Plattner, Seltisberg; Sebastian Stäubli, Magden, and Fred von Kaenel, Seltisberg, all of Switzerland, assignors to Ciba Geigy Ag, Basle, Switzerland

Continuation of Ser. No. 352,730, Feb. 26, 1982, abandoned.
This application Dec. 7, 1983, Ser. No. 559,149
Claims priority, application Switzerland, Dec. 20, 1979, 11315/79
Int. Cl.[3] C07C *143/60*
U.S. Cl. 260—508 7 Claims



1. A process for the production of 2-amino-1-naphthalenesulfonic acid (Tobias acid), which comprises

(a) introducing into a suitable reaction vessel, simultaneously and continuously, separate streams of a 20–30% suspension of 2-hydroxynaphthalene in a water-immiscible organic solvent which is inert to chlorosulfonic acid, and of chlorosulfonic acid which may be diluted with the same solvent, in the temperature range from −10° to +10° C., in such concentration and at such a rate of addition that an anhydrous reaction mixture having a molar ratio of chlorosulfonic acid to 2-hydroxynaphthalene of about 0.90 to about 1.05 to 1 is obtained, and leaving the reaction mixture for about 10 to 150 minutes in the reaction vessel to give 2-hydroxy-1-naphthalenesulfonic acid (oxy-Tobias acid),

(b) removing HCl from the reaction mixture by desorption under a pressure of 100–400 mbar in the temperature range from 0° to 60° C.,

(c) treating the residual oxy-Tobias acid containing reaction mixture for 10 to 60 minutes with an aqueous 25–35% ammonia solution in the temperature range from 40° to 80° C. until the pH value of the previously acid solution is at least 6, to get the ammonium salt of the oxy-Tobias acid and adding sufficient further water that two liquid phases clearly form, subsequently,

(d) separating the organic solvent phase from the aqueous phase and after removal of residual 2-hydroxynaphthalene by extraction with an organic water-immiscible solvent, stripping off remaining solvent from the aqueous phase in vacuo at 200–400 mbar and in the temperature range from 60° to 80° C.,

(e) treating the resultant aqueous solution of the ammonium salt of oxy-Tobias acid, without increasing the concentration beforehand, with NH_3 and concentrated $(NH_4)_2SO_3$ or $(NH_4)HSO_3$ solution in the temperature range from 120° to 150° C. and at a pressure of 10 to 20 bar for 4 to 12 hours until the pH value is 9 to 12, to give the ammonium salt of 2-amino-1-naphthalenesulfonic acid (Tobias acid), and, after stripping off NH_3 and removal of 2-naphthylamine by extraction with an aromatic hydrocarbon,

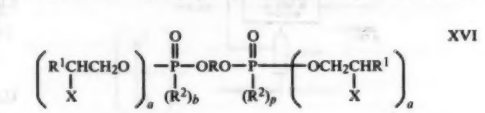
(f) adding to the reaction mixture, in the temperature range from 30° to 70° C., sufficient dilute 40–60% sulfuric acid to adjust the pH value to 1.2–1.75, removing SO_2 from the resultant suspension by desorption in vacuo at 0.1 to 0.9 bar and in the temperature range from 30° to 70° C., and, after cooling to about 30° C., isolating the pure Tobias acid by filtration and, if desired, drying it.

4,510,101
HALOGENATED PHOSPHORUS HYDROXY-ALKYL AND T-ALKOXYALKYL ESTERS

Chester E. Pawloski, Bay City, and Sally P. Ginter, Sanford, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 18, 1983, Ser. No. 476,662
Int. Cl.[3] C07F *9/11, 9/32;* C08G *18/00*
U.S. Cl. 260—928 8 Claims

1. Phosphorus compounds containing α-halo hydroxyalkyl or α-halo t-alkoxyalkyl groups corresponding to the formula



wherein

R independently in each occurrence is alkylene, haloalkylene, alkenylene, haloalkenylene, phenylene, diphenylene, halophenylene, dihalophenylene, and oxyalkylene;

R^1 independently in each occurrence is hydrogen, CH_2OR^3, CH_2OH, haloalkyl, phenyl, halophenyl or methyl phenoxy;

R^2 independently in each occurrence is haloalkyl, phenyl, haloaryl or alkyl;

R^3 independently in each occurrence is t-alkyl;

X independently in each occurrence is bromine or chlorine;

a is independently in each occurrence 1 or 2; and

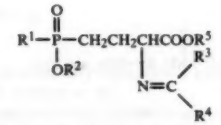
b is independently in each occurrence 0 or 1, with the proviso that at least one R^1 is CH_2OR^3 or CH_2OH.

4,510,102
PHOSPHINIC ACID ESTERS AND PROCESS FOR PREPARING THE SAME

Nobuto Minowa, Yokohama; Shunzo Fukatsu, Tokyo; Taro Niida, Yokohama, and Sadaaki Mase, Tokyo, all of Japan, assignors to Meiji Seika Kaisha Ltd., Tokyo, Japan

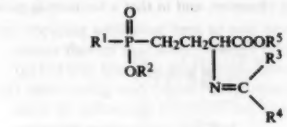
Filed Jan. 18, 1983, Ser. No. 458,946
Claims priority, application Japan, Jan. 29, 1982, 57-13985
Int. Cl.[3] C07F *9/32*
U.S. Cl. 260—941 22 Claims

1. A compound represented by the formula (V'):



wherein R^1 and R^2 are same or different and each represent a straight or branched chain alkyl group having from 1 to 5 carbon atoms, an aryl group or an aralkyl group, R^3 and R^4 are same or different and R^3, R^4 and R^5 each represent a hydrogen atom, a straight or branched chain alkyl group having from 1 to 5 carbon atoms, an aryl group or an aralkyl group, provided that R^3 and R^4 are not hydrogen atoms at the same time.

2. A process for preparing a compound represented by the formula (V'):



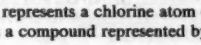
(V')

wherein R^1 and R^2 are same or different and each represent a straight or branched chain alkyl group having from 1 to 5 carbon atoms, an aryl group or an aralkyl group, R^3 and R^4 are same or different and R^3, R^4 and R^5 each represent a hydrogen atom, a straight or branched chain alkyl group having from 1 to 5 carbon atoms, an aryl group or an aralkyl group, provided that R^3 and R^4 are not hydrogen atoms at the same time, which comprises the steps of; reacting a compound represented by the formula (I):

(I)

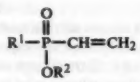
wherein, R^1 and R^2 are as defined above, and

X represents a chlorine atom or a bromine atom, with a compound represented by the formula (II):



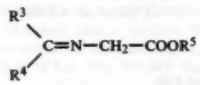
(II)

wherein, X' represents a chlorine atom or a bromine atom, to give a compound having the formula (III):



(III)

wherein, R^1 and R^2 are as defined above, reacting the compound having the formula (III) with a compound represented by the formula (IV):



(IV)

wherein, R^3, R^4 and R^5 are as defined above, in the presence of a base.

4,510,103

METHOD OF MOLDING A COMPOSITE BODY INVOLVING A THERMOSETTING RESIN

Yasuhiro Yamaguchi, and Yoshiaki Sakatani, both of Nagoya, Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sep. 19, 1983, Ser. No. 533,502
Claims priority, application Japan, Sep. 28, 1982, 57-167658
Int. Cl.³ B29C *11/00*; B29G *7/00*
U.S. Cl. 264—40.2 **5 Claims**

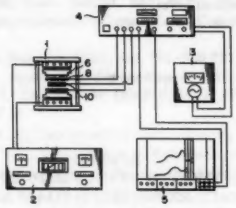
1. A method for forming a molded body from a material including at least a thermosetting resin, comprising:

disposing said material in a mold;

heating said material in a desired time-temperature sequence;

monitoring at least one of the capacitance and dielectric loss coefficient of said material while heating said material until an abrupt change occurs in at least said one of said capacitance and said dielectric loss coefficient;

determining an optimum pressure-starting time from said abrupt change; and



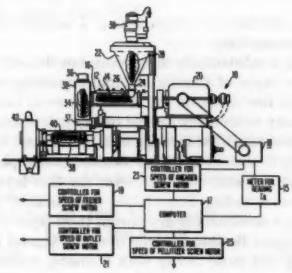
applying pressure to said material in said mold beginning substantially at said optimum pressure starting time.

4,510,104

APPARATUS AND METHOD FOR AUTOMATICALLY CONTROLLING AN EXTRUDER FOR THERMOPLASTIC MATERIAL

Charles A. Weaver, Indianapolis, and Joseph W. Stephens, Plainfield, both of Ind., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 7, 1983, Ser. No. 539,933
Int. Cl.³ B29B *1/10, 3/02*
U.S. Cl. 264—40.7 **11 Claims**



1. A method of automatically controlling the output of an extruder for thermoplastic material which includes a kneader screw, an inlet feed screw for feeding dry particulate material to the inlet end of the kneader screw and an outlet feed screw for removing molten material from the outlet end of the kneader screw, each of said screws being rotated by a separate electric motor, said method comprising the steps of

continuously monitoring the current of the electric motor for the kneader screw as the thermoplastic material is fed along the kneader screw, and

varying the speed of the inlet feed screw and/or outlet feed screw upon variations in the current of the kneader screw motor to maintain the current at a substantially uniform level.

8. In an extruder for thermoplastic material which includes a kneader screw, an inlet feed screw extending to the inlet end of the kneader screw for feeding dry particulate material to the inlet end of the kneader screw and an outlet feed screw at the outlet end of the kneader screw for removing molten material from the outlet end of the kneader screw, each of said screws being rotated by a separate electric means, the improvement comprising

means for automatically controlling the output of the extruder comprising means for continuously monitoring the current of the electric motor for the kneader screw as the thermoplastic material is fed along the kneader screw, and

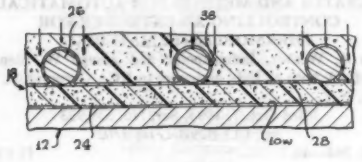
means for varying the speed of the inlet feed screw and/or the outlet feed screw upon variations in the current of the kneader screw motor to maintain the current at a substantially uniform level.

4,510,105

METHOD OF MANUFACTURING A SURFACE-REINFORCED FOAM ARTICLE

Kent Sherwood, 2612 Highland Ave., Santa Monica, Calif. 90405

Filed Aug. 19, 1982, Ser. No. 409,563
Int. Cl.³ B29D *27/04*; B32B *5/20*
U.S. Cl. 264—46.6 **8 Claims**



1. A method for constructing a surface-reinforced foam article comprising:

laying a substantially dry porous but flow-through resistant first layer of flexible material consisting of substantially only fine fibers on the walls of a mold cavity, said mold cavity walls being devoid of any geletaneous coating that could penetrate through said first layer;

laying a second layer of flexible easily permeated cloth material with openings, over the first layer, said second layer including fibers larger than those of said first layer;

laying a substantially dry porous third layer of flow-through resistant flexible material over the second layer; and

filling said mold cavity with foamable material which will form an expanding foaming liquid that solifiifies into a solid foam, and closing said mold;

the amount of foamable material in said cavity being chosen, that the foaming foamable material permeates completely through said third layer and the openings of said second layer and permeates at substantially all areas of the mold, into said first layer before solidifying.

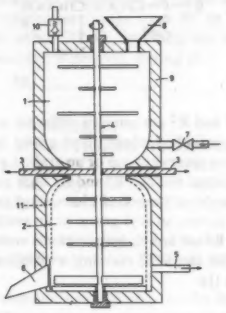
4,510,106

PROCESS AND APPARATUS FOR PRE-FOAMING SYNTHETIC PLASTICS

Kurt Hirsch, Linsengasse 55, 9020 Klagenfurt, Kärnten, Austria

Filed Nov. 15, 1983, Ser. No. 551,858
Claims priority, application Austria, Nov. 15, 1982, 4154/82
Int. Cl.³ B29D *27/00*; F26B *13/30*
U.S. Cl. 264—53 **8 Claims**

1. A process for pre-foaming a volatile liquid blowing agent-containing granular plastic material in which process the granular plastic material is heated by steam and foamed while being stirred, after which the pre-foamed plastic material particles are dried and stabilized, characterized in that the pre-foamed plastic material particles are transferred without an intermediate resting stage from a sealed pre-foaming chamber into a drying and stabilizing chamber, and in that a vacuum is maintained in this chamber during the drying and stabilizing operation.



4,510,107

METHOD OF MAKING DENSIFIED Si_3N_4/OXYNITRIDE COMPOSITE WITH PREMIXED SILICON AND OXYGEN CARRYING AGENTS

Andre Ezis, Grosse Ile, and Howard D. Blair, Romulus, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

PCT No. PCT/US83/01116, § 371 Date Jul. 19, 1983, § 102(e) Date Jul. 19, 1983
PCT Filed Jul. 19, 1983, Ser. No. 523,196
Int. Cl.³ C04B *35/58*
U.S. Cl. 264—65 **22 Claims**

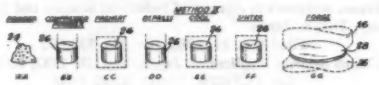
1. In a method of making a densified silicon nitride comprising object, wherein silicon powder is subjected to sequential heating including first a nitriding heating to form silicon nitride and second a heating to fuse the resulting silicon nitride, the improvement comprising having yttrium silicon oxynitride present with said silicon or silicon nitride prior to said heating to fuse, a major proportion of the yttrium silicon oxynitride is of the $Y_{10}Si_6O_{24}N_2$ phase, said yttrium silicon oxynitride serving to dissolve said silicon nitride during said second heating to fuse and to convert to a more stable phase as a result of the second heating to fuse.

4,510,108

METHOD OF FORMING BLANKS FOR THE SOLID-PHASE FORMING OF THERMOPLASTIC ARTICLES

Kenneth J. Cleereman, Salida, Colo.; O. Carl Raspor, Saginaw, and Alan F. Burmester, Midland, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 29, 1982, Ser. No. 427,232
Int. Cl.³ B29C *25/00*
U.S. Cl. 264—119 **11 Claims**



1. A process for forming a plastic article from thermoplastic polymeric resinous powder wherein a sufficient quantity of said powder for making said article is compressed into a briquette having green strength, the improvement comprising the steps of:

(a) preheating said briquette such that the center thereof is somewhat less than the melt temperature of the resinous powder forming the briquette,

(b) repressing said briquette while at about the same temperature;

(c) applying additional heat to said briquette such that the center thereof is at a temperature higher than that of step (a) but still less than said melt temperature,

(d) maintaining said higher temperature for a period sufficient to soften said briquette and sinter the same short of complete melting thereof; and

(e) forging the briquette into said article while the briquette is at a temperature within said temperature range to effect substantial plug flow deformation of the briquette and obtain substantial fusion of the powder forming said briquette.

4,510,109

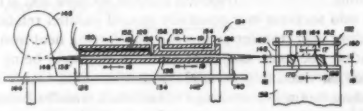
METHOD FOR MAKING ARROW FLETCHING

Richard F. Carella, 35572 Strathcona, Mount Clemens, Mich. 48043

Division of Ser. No. 275,167, Jun. 19, 1981, Pat. No. 4,392,654. This application Mar. 25, 1983, Ser. No. 478,783

Int. Cl.³ B28B *7/14*

U.S. Cl. 264—151 **12 Claims**



1. A method for making a curved array fletching from a plastic sheet comprising: bending the plastic sheet around a mandrel to a cylindrically curved shape without any abrupt fold; heating the bent plastic sheet to a softened condition while engaged with the mandrel; cooling the bent plastic sheet while engaged with the mandrel to maintain the curvature thereof; and cutting a curved arrow fletching from the curved plastic sheet.

4,510,110

HIGH EFFICIENCY, FAST EXTRUDERS FOR EXTRUDING AND REFINING SOAP AND DETERGENTS

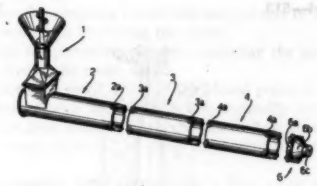
Aldo Mazzoni, Busto Arsizio, Italy, assignor to Costruzioni Meccaniche G. Mazzoni S.p.A., Busto Arsizio, Italy

Division of Ser. No. 306,669, Sep. 29, 1981, abandoned. This application Sep. 28, 1983, Ser. No. 536,667

Claims priority, application Italy, Sep. 30, 1980, 25032 A/80

Int. Cl.³ B29F *3/02*

U.S. Cl. 264—176 R **4 Claims**



1. In a method of making soap, comprising supplying soap to one end of a helix disposed in a casing, and rotating the helix to move the soap lengthwise along the casing and out of the casing; the improvement comprising rotating the helix at a speed between 20 and 50 rpm, providing the length of the helix between 5 to 15 times its diameter, providing a winding angle for the helix between 15° and 25°, providing the helix diameter between about 150 mm, and providing the depth of the helix between 30 and 35 mm.

4,510,111

PROCESS FOR PRODUCING ACRYLIC FIBERS HAVING NON-CIRCULAR CROSS-SECTIONS

Shigeru Sawanishi; Yozo Shiomi, and Akira Yamane, all of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Aug. 26, 1983, Ser. No. 526,881

Claims priority, application Japan, Sep. 6, 1982, 57-155562

Int. Cl.³ D01D *5/06;* **D01F** *6/18, 11/04*

U.S. Cl. 264—177 F **7 Claims**

1. A process for producing acrylic fibers having non-circular cross-sections, of which the degree of flatness is more than 1.5, characterized by integrally combining the following process requirements:

(1) preparing an acrylonitrile polymer spinning solution of 40°–70° C. by dissolving an acrylonitrile polymer in an inorganic solvent, which spinning solution has a viscosity of 40–200 poises at 30° C.,

(2) wet-spinning the spinning solution through a spinnerette having circular spinning orifices, and holding it in a first coagulating bath, 5–35 weight % in solvent concentration and having a temperature of −5° C. to 5° C., for a duration of time of $d \times \frac{1}{4}$ to d seconds, wherein d is the single-filament denier number of the fibers to be finally obtained,

(3) holding the coagulated gel filaments in a second coagulating bath, 5–35 weight % in solvent concentration and having a temperature from 6° C. to 40° C., for a duration of time more than d seconds,

(4) washing the coagulated gel filaments with water and wet-heat stretching the filaments 4 times in length at a temperature higher than 80° C.

4,510,112

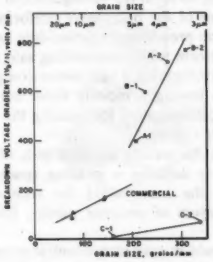
PROCESS FOR FABRICATING ZNO-BASED VARISTORS

Robert J. Lauf, Oak Ridge, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jan. 21, 1983, Ser. No. 459,922

Int. Cl.³ H01B *1/08*

U.S. Cl. 264—234 **8 Claims**



1. A process for producing a metal-oxide varistor, comprising:

providing a varistor sol-gel powder mix including ZnO and at least one metal-oxide dopant,

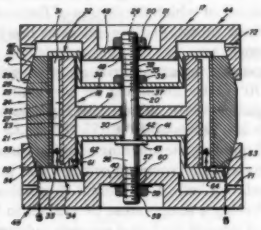
forming a densified compact of said mix by hot-pressing the same until the density of said compact exceeds about 50% of theoretical in a reducing atmosphere so as to reduce said ZnO to sub-stoichiometric zinc oxide, and

heating the resulting compact in an oxidizing atmosphere so as to effect restoration of said sub-stoichiometric oxide to stoichiometric ZnO.

4,510,113
BELT SLEEVE MANUFACTURING METHOD AND APPARATUS

Hiroshi Takano; Hiroshi Yokoyama, both of Hyogo, and Takahide Mizuno, Kobe, all of Japan, assignors to Mitsuboshi Belting Ltd., Kobe, Japan

Filed Mar. 24, 1983, Ser. No. 478,444
Claims priority, application Japan, Mar. 25, 1982, 57-48292
Int. Cl.[3] B29C *1/14, 1/16;* B29D *29/02*
U.S. Cl. 264—257 18 Claims



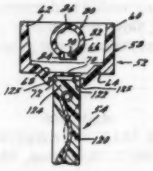
1. The method of forming a belt sleeve comprising:
providing an inner mold having a radially outer surface defining a preselected configuration for forming the inner surface of the desired belt sleeve;
providing a preform comprising layers of uncured rubber, fabric, and tensile cord concentrically about said inner mold;
providing end members at the axially opposite ends of said inner mold for effectively defining a molding space concentrically surrounding the inner mold in which said preform is disposed;
providing in spaced concentric relationship to said inner mold a split outer mold having a radially inner surface defining a preselected configuration for forming the outer surface of the desired belt sleeve;
forcibly urging the outer mold radially inwardly to compress said preform and cause radially inner and outer surfaces thereof to conform accurately to said mold inner and outer surfaces with said mold configuration maintained accurately in a preselected relationship with each other, thereby to form the configurations of the inner and outer surfaces of the belt sleeve preform in correspondingly accurate preselected relationship; and
curing said preform while maintaining said urging.

8. Apparatus for forming a belt sleeve comprising:
an inner mold having a radially outer surface defining a preselected configuration for forming the inner surface of a desired belt sleeve;
end members at the axially opposite ends of the inner mold for effectively defining a molding space concentrically surrounding the inner mold for receiving a preform formed of layers of uncured rubber, fabric and tensile cord;
a split outer mold in spaced concentric relationship to said inner mold having a radially inner surface defining a preselected configuration for forming the outer surface of the desired belt sleeve; and
means for forcibly urging the outer mold radially inwardly to compress the preform and cause radially inner and outer surfaces thereof to conform accurately to said mold inner and outer surfaces, said urging means including means for causing the mold configurations to be maintained accurately in a preselected relationship with each other while concurrently curing the preform and maintaining said urging and thereby form the configurations of the inner and outer surfaces of the belt sleeve preform in correspondingly accurate preselected relationship.

4,510,114
METHOD OF MAKING AN ICE MAKING APPARATUS

Kenneth L. Nelson, Albert Lea, Minn., assignor to King-Seeley Thermos Co., Prospect Heights, Ill.

Division of Ser. No. 356,855, Mar. 10, 1982, Pat. No. 4,458,503, which is a division of Ser. No. 150,445, May 16, 1980, abandoned. This application Apr. 27, 1984, Ser. No. 604,590
Int. Cl.[3] B32B *31/06*
U.S. Cl. 264—261 34 Claims

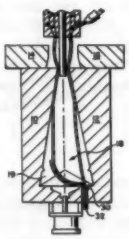


12. In the method of fabricating a combination evaporator and ice form for an ice making machine or the like, the steps which include,
providing a series of refrigerant conduit sections and arranging said sections in a generally spaced parallel relation,
providing heat transfer means for transferring heat into said conduit sections, said heat transfer elements being disposed between said parallel conduit sections,
providing mounting openings in said heat transfer elements and forming an aligned opening in said moldable material, whereby a fastening element may extend through said aligned openings for operatively securing said combination evaporator and ice form in an associated ice making machine,
molding a material adjacent at least portions of said conduit sections and said heat transferring means, and
forming ice make-up water receiving pockets in said material which are arranged in heat transfer relation to said heat transfer means, whereby when a suitable heat transfer media is circulated through said conduit sections and ice make-up water is introduced into said pockets, said water will freeze into ice products within said pockets.

4,510,115
METHOD FOR FORMING LAYERED THERMOPLASTIC ARTICLES

Cem Gokcen, Norwich, England, and Robert J. Williams, Chicago, Ill., assignors to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Nov. 3, 1982, Ser. No. 438,813
Int. Cl.[3] B29C *17/07*
U.S. Cl. 264—515 7 Claims



1. A method of forming a hollow thermoplastic article comprising the steps of:
continuously feeding a first thermoplastic material into a blow molding die while intermittently, simultaneously

feeding a second thermoplastic material into the blow molding die, the second material being incompatible with the first material;

extruding the first and second thermoplastic materials from the blow molding die to form a thermoplastic parison having a first section comprising a single layer of the first material and a second section comprising an inner layer of the first material and an overlying layer of the second material;

closing off the second section of the parison within a mold cavity to form a closed end wall comprising the inner first material layer covered by an overwrap formed by the overlying layer of the second material which, due to its incompatibility, can be selectively peeled away when desired to expose the inner first material layer without otherwise opening the end wall;

blow molding the closed off parison in the mold cavity to form the desired configuration of the hollow article comprising side walls formed from the first parison section and the closed end wall formed from the second parison section; and,

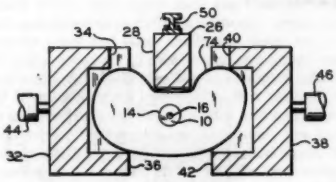
forming in the closed end wall of the hollow article an access port which is normally covered by the peel-away overwrap and which, upon peeling away of the overwrap, is exposed for use.

4,510,116

APPARATUS AND METHOD FOR BLOW MOLDING

Donald L. Peters; John R. Rathman, and Irvin L. Sumpter, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 27, 1983, Ser. No. 517,604
Int. Cl.³ B29C *17/07*
U.S. Cl. 264—529 **10 Claims**



1. Apparatus comprising

a means for extruding a molten tubular parison from between a die and a ring into a closeable mold, said tubular parison to have a first end attached to said means and a second end;

a means for pinching closed the second end of the tubular parison prior to closing the mold;

a means for pneumatically pre-expanding the parison prior to closing the mold;

said closeable mold, when in the closed position, defining a chamber with at least one longitudinally extending rib protruding inwardly from the sidewall of the chamber in the range of from 2 to about 25 percent across the chamber;

said closeable mold comprising a first mold part which determines the rib, said first mold part having a first face and a second face;

a second mold part which determines a first side portion of the chamber, said second mold part having a first face and a second face; and

a third mold part which determines a second side portion of the chamber, said third mold part having a first face and a second face;

the first face of the first mold part matching with the first face of the second mold part and the second face of the first mold part matching with the first face of the third mold part;

a means for providing a closure between the second face of the second mold part and the second face of the third mold part;

a means for moving the second mold part into a position so that the first face of the second mold part matches with the first face of the first mold part; and

a means for moving the third mold part into a position so that the first face of the third mold part matches the second face of the first mold part.

8. A method for blow molding a plastic article from a parison comprising

extruding a molten tubular parison along the side of an elongated rib, said rib to be positioned along the parting line of a pair of mold parts to form a chamber having an inwardly protruding rib extending partway thereacross and then pinching shut the open end of the parison;

thereafter pneumatically expanding the parison partially around the elongated rib;

then moving the mold parts into contact with the elongated rib while pinching a flash line of said parison between the elongated rib and the mold parts; and

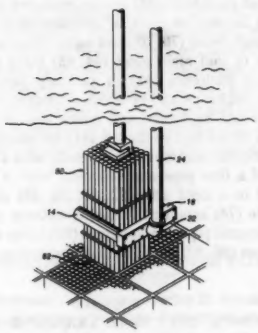
pneumatically expanding the inside of the parison to fit the chamber defined by the mold parts and the elongated rib.

4,510,117

APPARATUS FOR IN SITU DETERMINATION OF BURNUP, COOLING TIME AND FISSILE CONTENT OF AN IRRADIATED NUCLEAR FUEL ASSEMBLY IN A FUEL STORAGE POND

John R. Phillips; James K. Halbig; Howard O. Menlove, and Shirley F. Klosterbuer, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Feb. 10, 1983, Ser. No. 465,419
Int. Cl.³ G21C *17/00*
U.S. Cl. 376—257 **7 Claims**

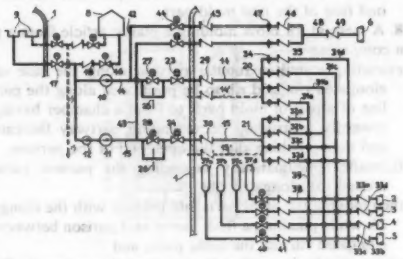


1. A detector head for determining the exposure, cooling time and fissile content of an irradiated nuclear fuel assembly submerged in a spent-fuel storage pond, comprising two spaced apart parallel detector arms extending from a housing, each detector arm including two fission chambers for detecting passive neutrons and an ionization chamber for detecting gross gamma radiation, one of the fission chambers in each detector arm being shielded by a cadmium shield such that the ratios of the outputs of the shielded and unshielded fission chambers can be utilized to determine and compensate for the presence of boron in the water of the storage pond, and whereby the outputs of the fission and ionization chambers can be utilized to verify the declared exposure, fissile content, and cooling time of the fuel assembly.

4,510,118
DEVICE FOR SAFETY INJECTION ON A PRESSURIZED-WATER NUCLEAR REACTOR

Mariana Esayan, Courbevoie, and Michel Vilain, Le Pecq, both of France, assignors to Framatome & Cie., Courbevoie, France

Filed Oct. 12, 1982, Ser. No. 434,139
Claims priority, application France, Oct. 16, 1981, 81 19478
Int. Cl.³ G21C *9/00*
U.S. Cl. 376—282 **4 Claims**



1. Device for safety injection in a pressurized-water nuclear reactor, for the injection of cooling water into a primary circuit in the event of leakage therein, including at least two separate injection trains each consisting of at least one set of means (60, 61, 62) for pumping water at a given pressure from a reservoir (58, 59) arranged outside a safety enclosure (51) of said reactor and an injection pipe (64, 65), called the main pipe, which receives the water leaving said pumping means (60, 61, 62) and enters said safety enclosure (51) and is connected to a distributor drum (70, 70') arranged inside said enclosure (51) for the distribution of the water from main pipes (64, 65, 64', 65') into each of the cold arms (52, 53, 54, 55) of said primary circuit through distributor pipes (71, 72), at least one block valve (81, 82) being located in each of the main pipes (64, 65) outside said enclosure (51) and at least one non-return valve (76) being located in each of said distributor pipes (71, 72) between said drums (70, 70') and said cold arms (52, 53, 54, 55), from each of said main pipes (64, 65) there being tapped off outside said enclosure (51) an auxiliary pipe (84, 85) which enters said enclosure and in which is located a block valve (96, 97) outside said enclosure, and which has a branching-off (86, 87, 88, 89) inside said enclosure (51) for placing said auxiliary pipe (84, 85) into communication firstly with a hot arm (56, 56') by way of a first pipe and secondly with a distributor pipe connected to a cold arm (52, 53, 54, 55) downstream of a clack-valve (74) arranged in said distributor pipe (71, 72), by way of a second pipe, clack-valves (90) being arranged in each of said pipes (86, 87, 88, 89) of said branching-off.

4,510,119
DIAGNOSTIC TEST BEAD TRANSFER APPARATUS

Richard C. Hevey, Paoli, Pa., assignor to Centocor, Inc., Malvern, Pa.

Filed May 7, 1982, Ser. No. 376,023
Int. Cl.³ B01L *9/06*; G01N *33/56*
U.S. Cl. 422—71 **2 Claims**

1. A diagnostic test apparatus for use in an immunoassay, comprising:

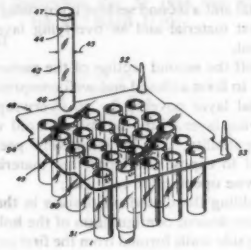
a. a receptacle tray of resilient material having a plurality of wells for receiving samples,

b. said receptacle tray having at the least one pilot hole,

c. a test tube rack of resilient material having a plurality of holes for insertion of test tubes, said test tube rack having at least one pin for insertion into the pilot hole of the receptacle tray,

d. test tubes of generally cylindrical shape composed of resilient material, said test tubes having a varying outside diameter so as to form a friction fit when pressed into test tube rack,

e. indicia of marking of correlating nature present on said test tube rack and receptacle tray, and

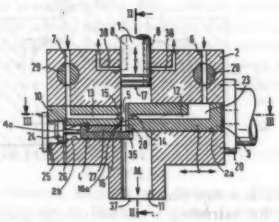


f. a plunger and precut plugboard means for inserting test tube plugs into several test tubes essentially simultaneously.

4,510,120
MIXING HEAD

Adolf Bauer, Olching, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Sep. 28, 1982, Ser. No. 426,102
Claims priority, application Fed. Rep. of Germany, Nov. 12, 1981, 3144920
Int. Cl.³ B01F *5/04, 15/02*; B01J *14/00*
U.S. Cl. 422—133 **12 Claims**



1. A mixing head for at least two reactive components comprising:

a housing formed with a bore defining a mixing chamber and having an outlet for discharge of a reaction mixture;

a control plunger displaceable in said bore from a position wherein said plunger is retracted from said outlet into a position wherein said plunger is proximal to said outlet thereby driving a reaction mixture from said mixing chamber out of said outlet;

at least two nozzles which form a pair of nozzles in said housing juxtaposed with one another in a direction along the path of said plunger for impinging streams of respective interreactive components against one another to form said reaction mixture;

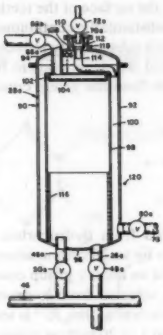
a nozzle body carrying one of said nozzles and shiftable transversely of the direction of displacement of said plunger into said chamber toward the other of said nozzles; and

means for advancing said body into said chamber into said path of said plunger and retracting said body from said chamber out of said path.

4,510,121
POWER RECOVERY SYSTEM FOR COAL LIQUEFACTION PROCESS

Joel R. Horton, Maryville, and David M. Eissenberg, Oak Ridge, both of Tenn., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Nov. 17, 1982, Ser. No. 442,331
Int. Cl.³ B01D *19/00*
U.S. Cl. 422—232 **3 Claims**



1. An apparatus for supplying feed material to a reactor vessel for treating said feed material at a high pressure and temperature to produce a gas-containing reactor product effluent at a relatively high pressure, feed material supply means, a flow work exchanger comprising an outer shell defined by (1) a vertically oriented tubular sidewall, an upper end cover and a lower end cover, and (2) a vertically oriented tubular inner shell disposed within said outer shell and radially inwardly spaced from said sidewall to define a vertically oriented annulus between the inner and outer shells, the lower end of said inner shell being attached to said lower end cover and the upper end of said inner shell extending to a location adjacent to but spaced from said upper end cover, first conduit means coupled to said feed material supply means and said lower end cover for conveying feed material at a relatively low pressure into said inner shell, second conduit means coupled to the reactor vessel and said upper end cover for conveying said reactor product effluent from the reactor vessel into the upper portion of said inner shell for displacing feed material from said inner shell, third conduit means coupled to said lower end cover and said reactor vessel for conveying feed material displaced from said inner shell to the reactor vessel, fourth conduit means coupled to said upper end cover for conveying gas released from said reactor product effluent from the upper portion of said outer shell, and a fifth conduit means coupled to said outer shell for releasing reactor product effluent from said annulus.

4,510,122
PROCESS FOR EXTRACTING URANIUM FROM PHOSPHORIC ACIDS BY MEANS OF ALKYLPYROPHOSPHORIC ACIDS

Antoine Floreancig, St Genis Laval, France, assignor to Uranium Pechiney Ugine Kuhlmann, Paris, France

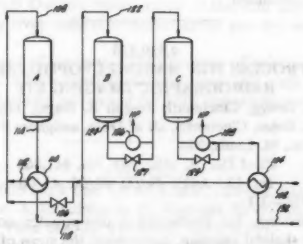
Filed Jul. 7, 1983, Ser. No. 511,478
Claims priority, application France, Jul. 30, 1982, 82 13820
Int. Cl.³ C01G *43/00*
U.S. Cl. 423—10 **16 Claims**

1. A process for extracting uranium contained in solutions of phosphoric acids by means of an extracting agent comprising an alkylpyrophosphoric acid, which process comprises bringing into contact, the inorganic, phosphoric acid phase and an organic phase containing the extracting agent, thereby producing an emulsion, wherein the emulsion is produced in a first step by simultaneously subjecting the two phases containing the phosphoric acid and the extracting agent for a period of time T_1 to an intense mechanical sheering action corresponding to a sheering coefficient of at least 5000 seconds^{-1}, thereby increasing the contact surfaces for contact between said two phases, and then abruptly breaking said emulsion, in a second step, in a time T_2, the sum T_1+T_2 of the times required for carrying out the two steps being at most 20 minutes.

4,510,123
TEMPERATURE CONTROLLED AMMONIA SYNTHESIS PROCESS

Bernard J. Grotz, Pasadena, Calif., assignor to C F Braun & Co., Alhambra, Calif.

Filed Nov. 26, 1982, Ser. No. 444,720
Int. Cl.³ C01C *1/04*
U.S. Cl. 423—360 **26 Claims**



19. A process for synthesizing ammonia from nitrogen and hydrogen carried out at a pressure greater than 100 atmospheres which process comprises (a) passing a mixture of hydrogen and nitrogen in continuous flow through a series of three catalyst beds; (b) heating at least a portion of the feed syngas prior to its entrance into the first catalyst bed by heat exchange with at least a portion of a final product effluent from the third catalyst bed in the series and with at least a portion of the effluent from the first catalyst bed in the series; and (c) cooling the effluent from each of the second and third catalyst beds in the series by means of a high pressure steam generator in series with the effluent from each of the second and third catalyst beds.

4,510,124
SYSTEM FOR RECOVERY OF CO_2 FROM FLUE GASES CONTAINING SO_2

John T. Sears, Bozeman, Mont., and Harish R. Anada, Morgantown, W. Va., assignors to Science Applications, Inc., La Jolla, Calif.

Filed Nov. 9, 1983, Ser. No. 549,895
Int. Cl.³ C01B *31/20;* **B01D** *53/34*
U.S. Cl. 423—437 **5 Claims**

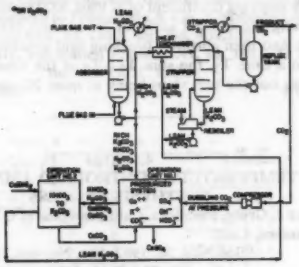
1. In a process for recovering CO_2 from flue gas containing CO_2 and SO_2 wherein the flue gas is contacted with potassium carbonate solution, the CO_2 and SO_2 components absorbed therein to form a liquor containing $KHCO_3$ and K_2SO_4, and the CO_2 removed from the said liquor, the improvement which comprises:

(a) converting the K_2SO_4 *L in the liquor to* $CaSO_4$ by incorporating Ca^{++} ions while adding CO_2 to the liquor in a pressurized vessel;

(b) removing $CaSO_4$ from the resulting liquor of step (a);

(c) conveying the liquor remaining from step (b) to a different container therefor;

(d) removing calcium ions from the liquor of step (c) by precipitating out $CaCO_3$ by raising the pH of the liquor;



(e) conveying the liquor remaining after step (d) to the potassium carbonate solution with which the flue gas is first contacted.

4,510,125

PROCESS FOR MAKING LYOPHILIZED RADIOGRAPHIC IMAGING KIT

Terry W. Grogg, Cincinnati; Joseph E. Bugaj, Harrison, and Paul E. Bates, Cincinnati, all of Ohio, assignors to Mallinckrodt, Inc., St. Louis, Mo.

Filed Dec. 8, 1982, Ser. No. 447,863

Int. Cl.³ A61K *49/00, 49/02, 43/00*

U.S. Cl. 424—1.1 **13 Claims**

1. A process, for producing a dry-powder composition, useful for skeletal imaging, comprising the steps of:

(a) preparing a solution which comprises a stabilizer selected from the group consisting of gentisate, ascorbate, and reductate compounds, and mixtures thereof;

(b) contacting said solution with a metal selected from the group consisting of tin and tin-containing alloys; and

(c) lyophilizing said solution.

4,510,126

REAGENT FOR THE DETERMINATION OF RISTOCETIN COFACTOR (V.WILLEBRAND FACTOR)

Peter Fuhge, Lahntal; Konrad Braun, Ebsdorfergrund, and Udo Becker, Munich, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 430,748

Claims priority, application Fed. Rep. of Germany, Oct. 22, 1981, 3141894

Int. Cl.³ G01N *1/00, 1/30, 33/48*

U.S. Cl. 424—3 **4 Claims**

1. An agent for determining ristocetin cofactor, which agent is a freeze-dried suspension of human platelets treated with diisopropyl fluorophosphate as a proteinase inhibitor and with a tanning agent selected from the group consisting of C_1–C_4-alkanaldehydes and C_2–C_6-dialdehydes.

4,510,127

COMPOSITIONS AND METHOD FOR REDUCING ELUTION OF THERAPEUTIC AGENTS FROM TEETH

Robert W. H. Chang, Shoreview, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 303,206, Sep. 18, 1981, Pat. No. 4,366,146, which is a division of Ser. No. 176,680, Aug. 11, 1980, Pat. No. 4,304,766, which is a division of Ser. No. 26,402, Apr. 2, 1979, Pat. No. 4,243,658, which is a continuation-in-part of Ser. No. 865,681, Dec. 29, 1977, abandoned. This application Sep. 27, 1982, Ser. No. 424,579

Int. Cl.³ A61K *7/18*

U.S. Cl. 424—52 **6 Claims**

6. A method of substantially reducing elution of a therapeutic agent previously applied to teeth which comprises the steps of

applying said therapeutic agent to teeth, and

applying a dentifrice composition to said treated teeth, wherein said dentifrice composition comprises (1) at least one ingredient selected from the group consisting of therapeutic agents, polishing agents, surfactants, flavoring agents, sweetening agents, thickening agents and humectants, and (2) at least 0.05% by weight of a nonionic, water-dispersible, membrane-forming material which, when applied to the surface of the teeth in an oral environment, forms a substantially continuous hydrophobic barrier thereon which substantially reduces the elution of said previously applied therapeutic agent from said teeth, and which is selected from the group consisting of

$(R^8)_bSi(R^9)_{4-b}$

$(R^{10})_xTi(OR^{11})_{4-x}$

$(R^{12})_xTi(R^{11})_{4-x}$

wherein R^8 is selected from hydrocarbon and fluorocarbon groups which contain up to 25 carbon atoms optionally substituted by chlorine; R is an alkoxy group containing from 1 to 6 carbon atoms; R^{10} is selected from hydrocarbon groups containing from 1 to 20 carbon atoms; R^{11} is selected from hydrocarbon groups of from 1 to 20 carbon atoms; R^{12} is a heterocyclic group containing only carbon, oxygen and hydrogen; b and x are selected from 0, 1, 2 and 3.

4,510,128

RESINATE OF A SUBSTITUTED CARBOXYLIC ACID, THE PREPARATION AND USE THEREOF, AND PHARMACEUTICAL COMPOSITIONS CONTAINING IT

Satish C. Khanna, Bottmingen, Switzerland, assignor to Ciba Geigy Corporation, Ardsley, N.Y.

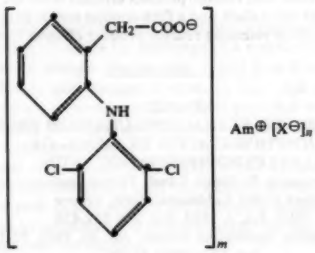
Filed Jan. 6, 1984, Ser. No. 568,976

Claims priority, application Switzerland, Jan. 12, 1983, 147/83

Int. Cl.³ A61K *31/74*

U.S. Cl. 424—79 **4 Claims**

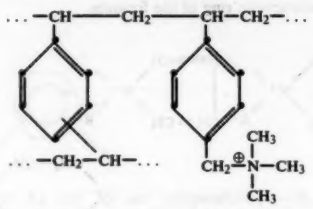
1. A resinate of the formula



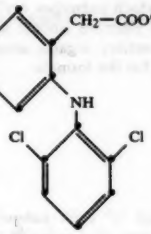
(I)

wherein

$Am^{\oplus}$ is a strongly basic copolymer of styrene and divinylbenzene which is in cationic form, said copolymer containing the sum of m+n quaternary ammonium groups and also containing, as main structural unit, the grouping of the formula



$X^{\ominus}$ is the anion of an acid different from the anion of the formula



and m and n denote the entire ionic capacity of the copolymer.

4,510,129

IMMUNOSTIMULATING AGENT

Jürgen Knop, Caldern; Hans-Harald Sedlacek, and Friedrich R. Seiler, both of Marburg, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 11,944, Feb. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 795,233, May 9, 1977, abandoned. This application Aug. 9, 1982, Ser. No. 406,531

Claims priority, application Fed. Rep. of Germany, May 11, 1976, 2620649

Int. Cl.³ A61K *39/42, 39/40, 39/12, 39/02*

U.S. Cl. 424—86 **6 Claims**

1. An agent for stimulating immunologic reactivity, consisting essentially of a physical admixture of an antigen wherein said antigen is Escherichia Coli, Vibrio Cholerae, rubella virus, wether erythrocytes or s.typhimurium and an effective amount of neuraminidase as adjuvant therefor containing 0.01 to 150 units of neuraminidase per dosage of antigen.

4,510,130

PROMOTING ANIMAL AND PLANT GROWTH WITH LEUPEPTIN

Herbert Platt, Great Neck, and Alfred Stracher, Roslyn Est., both of N.Y., assignors to Genetic Diagnostics Corporation, Great Neck, N.Y.

Filed May 20, 1983, Ser. No. 496,717

Int. Cl.³ A61K *37/00*

U.S. Cl. 514—2 **3 Claims**

1. A method of promoting the more rapid growth of a healthy animal, which comprises administering to said animal or to a food source of said animal a growth-promoting effective amount of leupeptin.

4,510,131

PURIFIED MULLERIAN INHIBITING SUBSTANCE AND METHOD OF USE

Patricia K. Donahoe, Weston; Gerald P. Budzik, Waltham, and David A. Swann, Lexington, all of Mass., assignors to The General Hospital Corporation, Boston, Mass.

Division of Ser. No. 287,943, Jul. 29, 1981, Pat. No. 4,404,188. This application Jul. 11, 1983, Ser. No. 512,553

Int. Cl.³ A61K *37/02;* **C07G** *7/00;* **C12Q** *1/29*

U.S. Cl. 424—105 **3 Claims**

1. A composition comprising Mullerian Inhibiting Substance (MIS) derived from testicular tissue having an activity of at least 1 as measured by the Mullerian organ regression test being substantially free of albumen and being about 7,000–8,000-fold enriched in MIS activity over natural testicular tissue per dry weight of tissue.

2. A composition comprising Mullerian Inhibiting Substance (MIS) derived from testicular tissue having an activity of at least 2–2.5 as measured by the Mullerian regression organ test; being substantially free of albumen and of proteinaceous material having a molecular weight of 35,000±10,000 Daltons and 70,000±10,000 Daltons, being about 15,000-fold enriched in MIS activity over natural testicular tissue per dry weight of said tissue.

3. A method of suppressing the growth of human ovarian cancer cells which comprises contacting said cells with a growth suppressing amount of the MIS composition of any of claims 1 or 2.

4,510,132

COMPOUNDS FOR USE IN ANTIBACTERIAL THERAPY

Martti Vaara, A. Kannistontie 10, Helsinki, SF-00320, Finland

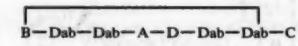
Filed Sep. 22, 1983, Ser. No. 534,617

Claims priority, application United Kingdom, Oct. 6, 1982, 8228545

Int. Cl.³ A61K *37/00;* **C07C** *103/52*

U.S. Cl. 514—11 **9 Claims**

1. A compound having the general formula



in which Dab is diaminobutyric acid; A is selected from a group comprising leucine, iso-leucine and phenylalanine; B is selected from a group comprising leucine and threonine; D is selected from a group comprising D-leucine and D-phenylalanine; and C is a substituent selected from the group comprising —Dab—Thr, —Dab—Thr—Dab, —Dab, —Dab—Thr—Acyl and H, in which Thr is threonine and Dab is as defined above the Acyl is a lower acyl group of 1 to 5 carbon atoms provided that

when A is leucine, B is threonine and D is D-leucine, then C representing —Dab—Thr is excluded;

when A is leucine and B is threonine, then C representing H or —Dab—Thr—Dab is excluded.

4,510,133

METHOD FOR COMBATING PESTS

David D. Evans, Finchampstead, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Mar. 28, 1983, Ser. No. 479,915

Claims priority, application United Kingdom, Apr. 22, 1982, 8211706

Int. Cl.³ A61K *31/71*

U.S. Cl. 514—30 **5 Claims**

1. A method for the control of insect pests of growing plants which comprises applying to the locus of the plant an insecticidally effective amount of an insecticidal composition comprising an insecticidally effective amount of a combination of at least one macrolide antibiotic substance selected from the group consisting of C-076 and B-41 antibiotics and acylated

derivatives and aglycones thereof and an insect feeding stimulant containing one or more of cottonseed flour, disaccharide and vegetable lipid oil in association with an insecticidally inert diluent or carrier material.

4,510,134

CONTROLLING NEMATODES IN ANIMALS AND SOIL WITH NEMATOCIDAL ANTIBIOTICS

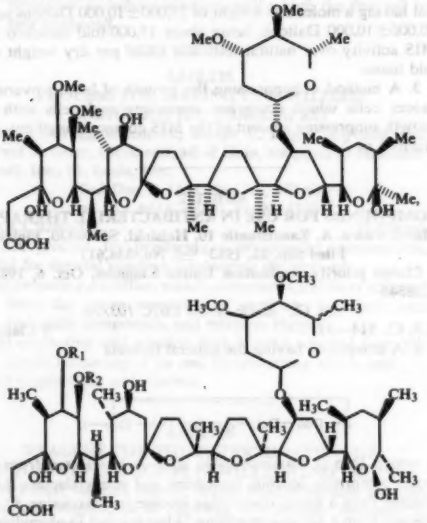
Irwin B. Wood, Pennington, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Filed May 7, 1982, Ser. No. 376,046

Int. Cl.³ A61K *31/71, 31/70, 35/74, 31/35*

U.S. Cl. 514—27 **8 Claims**

1. A method of controlling nematodes in warm-blooded animals infested with nematodes and in soil containing the nematodes by introducing orally into the animals or applying to nematodes in nematode-infested soil, a nematocidally effective amount of a compound



wherein R_1 is H or CH_3, R_2 is H or CH_3 and R_1 does not equal R_2 or pharmaceutically acceptable salts of the compounds, mixtures of the compounds or salts, or fermentation broths or harvest mash solids from which the nematocidal antibiotics are obtained.

4,510,135

ORALLY ADMINISTERED HEPARIN

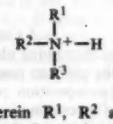
Lin-nar L. Teng, Bothell, Wash., assignor to Research Corporation, New York, N.Y.

Filed Apr. 21, 1982, Ser. No. 370,155

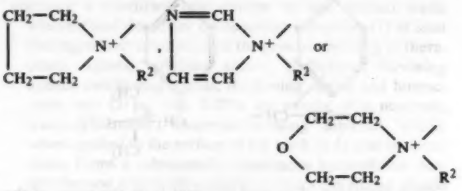
Int. Cl.³ A61K *31/73, 31/725;* **C08B** *37/10*

U.S. Cl. 514—56 **19 Claims**

1. A complex of heparin with a protonated tertiary organic ammonium ion, wherein said ammonium ion has the formula:

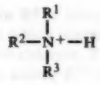


wherein R^1, R^2 and R^3 each independently represent a branched or unbranched alkyl group of 1 to 12 carbon atoms, which may be unsubstituted or substituted with hydroxy or alkoxy groups, or R^1 and R^3 together with the N atom can form a heterocyclic ring of the formula:

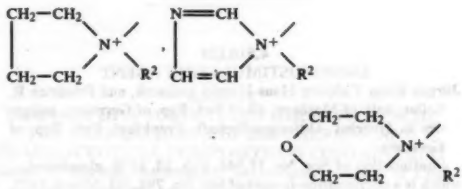


wherein R^2 has the meaning set forth above.

17. The process of orally administering a blood anticoagulant to a mammal which comprises orally administering in a blood anticoagulant effective amount a complex of heparin with a protonated tertiary organic ammonium ion, wherein said ammonium ion has the formula:



wherein R^1, R^2 and R^3 each independently represent a branched or unbranched alkyl group of 1 to 12 carbon atoms, which may be unsubstituted or substituted with hydroxy or alkoxy groups, or R^1 and R^3 together with the N atom can form a heterocyclic ring of the formula:



wherein R^2 has the meaning set forth above.

4,510,136

FUNGICIDAL 1,2,4-TRIAZOLE DERIVATIVES

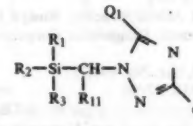
William K. Moberg, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 473,321, Mar. 15, 1983, abandoned, which is a continuation-in-part of Ser. No. 377,122, May 12, 1982, abandoned, which is a continuation-in-part of Ser. No. 349,261, Feb. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 276,986, Jun. 24, 1981, abandoned. This application Jun. 22, 1983, Ser. No. 506,894

Int. Cl.³ A61K *31/41;* **C07D** *249/08*

U.S. Cl. 514—63 **36 Claims**

1. A compound of the formula:

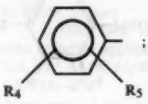


I

wherein

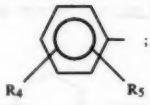
Q_1 and Q_2 are independently H or CH_3;

R_1 is C_2–C_{18} alkyl, C_3–C_6 cycloalkyl, naphthyl, or

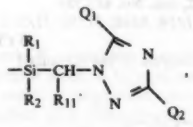


where R_4 and R_5 are independently —H, halogen, —OCH_3, —OCF_3, —SCH_3, —SO_2CH_3, phenyl, phenyl substituted with halogen and/or C_1–C_4 alkyl and/or —CF_3, phenoxy, phenoxy substituted with halogen and-/or C_1–C_4 alkyl and/or —CF_3, —CF_3, C_1–C_4 alkyl, or cyclohexyl; and

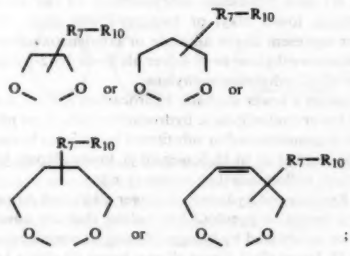
R_2 and R_3 are independently C_1–C_6 alkyl, C_3–C_6 cycloalkyl, OR_6, or



where R_6 is H, C_1–C_4 alkyl, or



with the proviso that when both R_2 and R_3 are OR_6, then R_6 must be C_1–C_4 alkyl; or R_2 and R_3 may be a 1,2- or 1,3- or 1,4-glycol bridge substituted by up to four alkyl groups R_7–R_{10} that have a total of up to four carbon atoms



R_{11} is H or C_1–C_4 alkyl;

and fungicidally active metal complexes or protic acid salts of said compounds.

25. A method for controlling fungus disease which comprises applying to the locus of infestation to be protected an effective amount of a compound of claim 1.

4,510,137

INSECTION COMPOSITIONS CONTAINING QUINALPHOS AND THIOMETON

Peter Meyes, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 209,996, Nov. 24, 1980, abandoned, which is a continuation-in-part of Ser. No. 107,427, Dec. 26, 1979, abandoned. This application Sep. 18, 1981, Ser. No. 303,605

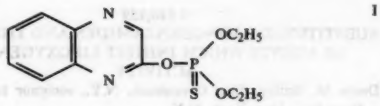
Claims priority, application United Kingdom, Jan. 2, 1979, 7900082

Int. Cl.³ A01N *57/00, 57/26*

U.S. Cl. 514—80 **2 Claims**

1. An insecticidal composition comprising a non-phytotoxic solid carrier or a non-phytotoxic liquid diluent and in the aggregate an insecticidally effective amount of

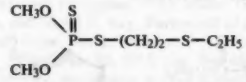
(a) the compound of formula I



I

in association with

(b) the compound of formula II



II

the weight ratio of the compound of the formula I to the compound of the formula II being in the range of from 1:1 to 1:4.

4,510,138

7-[2-(2-AMINOTHIAZOL-4-YL)-2-(SYN)-METHOXYIMINOACETAMIDO]CEPHALOSPORIN DERIVATIVES

Michihiko Ochiai, Suita; Akira Morimoto, Ikeda, and Yoshihiro Matsushita, Nishinomiya, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

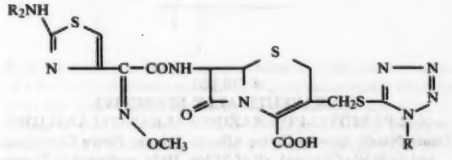
Division of Ser. No. 922,423, Jul. 6, 1978, , which is a division of Ser. No. 787,258, Apr. 13, 1977, abandoned. This application Sep. 29, 1982, Ser. No. 428,032

Claims priority, application Japan, Apr. 14, 1976, 51-42885; Sep. 8, 1976, 51-108102

Int. Cl.³ A61K *31/545;* **C07D** *501/56*

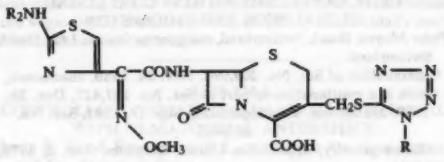
U.S. Cl. 514—206 **9 Claims**

1. A 7-[2-(2-aminothiazol)-4-yl)-2-(syn)-methoxyiminoacetamido]cephalosporin compound of the formula



wherein R_2NH is amino or a protected amino group and R is a di-C_{1-3}alkyl amino-C_{2-3}alkyl, carboxymethyl, or sulfomethyl group, or a pharmaceutically acceptable salt or ester thereof.

9. An antibacterial composition which comprises (a) an antibacterially effective amount of a 7-[2-(2-aminothiazol)-4-yl)-2-(syn)-methoxyiminoacetamido]cephalosporin compound of the



wherein R_2NH is amino or a protected amino group and R is a di-C_{1-3}alkyl amino-C_{1-3}alkyl, carboxymethyl, or sulfomethyl group, or a pharmaceutically acceptable salt or ester thereof in admixture with (b) a pharmaceutically acceptable excipient or diluent therefor.

4,510,139

SUBSTITUTED AMINOBENZAMIDES AND THEIR USE AS AGENTS WHICH INHIBIT LIPOXYGENASE ACTIVITY

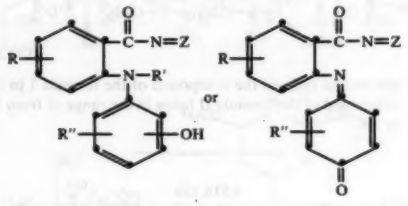
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Jan. 6, 1984, Ser. No. 568,870

Int. Cl.³ C07D *295/18;* **C07C** *103/22, 103/29, 103/85*

U.S. Cl. 514—234 **18 Claims**

1. A compound of the formula



wherein:

R is hydrogen, lower-alkyl, halo or lower-alkoxy;

R′ is hydrogen or lower-alkyl;

R″ is hydrogen, lower-alkyl or halo; and

N=Z is a member of the group consisting of amino, alkylamino having from one to four carbon atoms, dialkylamino having from two to eight carbon atoms, benzylamino, N-benzyl-N-alkylamino having from eight to ten carbon atoms, 5- or 6-ring-membered cycloalkylamino having from five to eight carbon atoms, 1-pyrrolidinyl, 1-piperidinyl, 4-morpholinyl, and lower-alkylated derivatives of said heterocyclic members.

4,510,140

THERAPEUTICALLY EFFECTIVE ω-(4-(2-PYRIDYL)-PIPERAZINO)-ALKANOYLANILIDES

Dante Nardi; Alberto Catto; Alberto Tajana; Pietro Cazzulani, and Gabriele Graziani, all of Milan, Italy, assignors to Recordati S.A., Chiasso, Switzerland

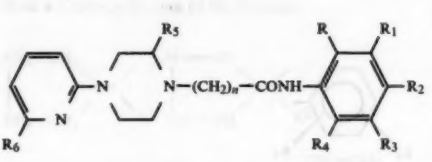
Filed Aug. 30, 1982, Ser. No. 412,818

Claims priority, application United Kingdom, Sep. 3, 1981, 8126754

Int. Cl.³ C07D *241/04;* **A61K** *31/495*

U.S. Cl. 544—360 **19 Claims**

1. An ω-[4-(2-pyridyl)-piperazino]-alkanoylanilide compound having the structural formula (I):



(I)

wherein n is 2, a maximum of one of the substituents R, R_1, R_2, R_3 or R_4 is halogen, C_2 alkoxy, hydroxy, nitro, amino, C_1 alkylthio, 1-hydroxy (C_2) alkyl, C_2 alkanoyl, C_2 alkoxycarbonyl, 3-(C_1) alkylureido or C_2 alkoxyoxalylamido, or alternatively two or four of the substituents R, R_1, R_2, R_3 or R_4 is a C_1 alkyl, the substituents R, R_1, R_2, R_3 and R_4 which are not selected from the group identified above are all hydrogen, R_5 is hydrogen or C_1–C_4 alkyl, and R_6 is hydrogen or C_1–C_4 alkoxy, or a pharmaceutically acceptable salt thereof.

4,510,141

TRICYCLIC POLYAZAHETEROCYCLES FOR TREATING DEPRESSION OR ANXIETY

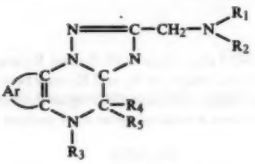
Roland Heckendorn, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Sep. 13, 1982, Ser. No. 417,788

Int. Cl.³ C07D *487/04, 471/14;* **A61K** *31/50, 31/535*

U.S. Cl. 514—250 **25 Claims**

1. A polycyclic polyazaheterocycle of the formula I



(I)

in which

R_1 and R_2 each represents, independently of one another, hydrogen, lower alkyl or hydroxy-lower alkyl, or together represent lower alkylene or ethyleneoxyethylene, ethyleneaza-ethylene or N-lower alkyl- or N-(2-hydroxy-lower alkyl)-ethyleneazaethylene;

R_3 represents a lower aliphatic hydrocarbon radical, a saturated lower cycloaliphatic hydrocarbon radical, or phenyl which is unsubstituted or substituted by halogen having an atomic number up to 35, lower alkyl, lower alkoxy, lower alkylthio, trifluoromethyl, cyano or nitro;

R_4 and R_5 represent hydrogen or lower alkyl; and Ar represents a benzo or pyrido(2,3-e) radical that are unsubstituted or substituted by halogen having an atomic number up to 35, lower alkyl, lower alkoxy, lower alkylthio, trifluoromethyl, cyano or nitro; and the pharmaceutically acceptable acid addition salts thereof.

2. A method for treating conditions of depression or anxiety in a mammal comprising administering to said mammal a therapeutically effective amount of a compound according to claim 1 or of a pharmaceutically acceptable acid addition salt thereof.

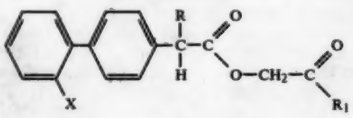
4,510,142

DERIVATIVES OF BIPHENYL ALKYL CARBOXYLATES AND THEIR USE AS MEDICAMENTS

Henry Cousse; Gilbert Mouzin; Jean-Pierre Tarayre, and Jean-Pierre Rieu, all of Castres, France, assignors to Pierre Fabre S.A., Paris, France

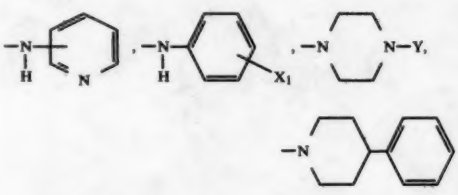
Filed Oct. 12, 1982, Ser. No. 433,987
Claims priority, application France, Oct. 14, 1981, 81 19316
Int. Cl.³ A61K 31/44, 31/495; C07D 341/04, 213/75
U.S. Cl. 514—255 12 Claims

1. A compound having the formula (I)



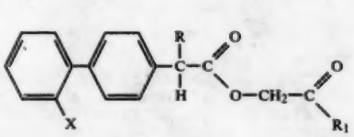
(I)

wherein x represents a monovalent group selected from a hydrogen atom and a halogen atom, R represents a monovalent group selected from a hydrogen atom or a straight or branched alkyl group having 1 to 4 carbon atoms, and R_1 represents a group selected from the following:

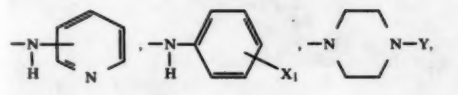


wherein X_1 represents a monovalent group selected from a hydrogen atom, a halogen atom and a CF_3 radical, and Y represents a monovalent group selected from a straight or branched alkyl group having 1 to 4 carbon atoms, a phenyl group and such group substituted by a substituent selected from a halogen atom and a CF_3 radical, and the therapeutically acceptable salts thereof.

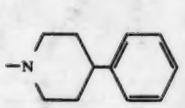
11. A method for treatment of obstinate pains and painful inflammatory syndromes, in a subject selected from the group consisting of humans and animals, which comprises administration to said subject of an effective amount of a compound having the formula (I)



wherein X represents a monovalent group selected from a hydrogen atom and a halogen atom, R represents a monovalent group selected from a hydrogen atom or a straight or branched alkyl group having 1 to 4 carbon atoms, and R_1 represents a group selected from the following:



-continued



wherein X_1 represents a monovalent group selected from a hydrogen atom, a halogen atom and a CF_3 radical, and Y represents a monovalent group selected from a straight or branched alkyl group having 1 to 4 carbon atoms, a phenyl group and such group substituted by a substituent selected from a halogen atom and a CF_3 radical, and the therapeutically acceptable salts thereof.

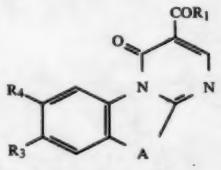
4,510,143

ANTIALLERGIC PYRIMIDO[1,2-A]QUINOXALIN-2-CARBOXYLIC ACID DERIVATIVES

Robert Westwood, Faringdon; Peter Miller; Ian R. Ager, both of Swindon, and David P. Kay, Purton, all of England, assignors to Roussel Uclaf, Paris, France

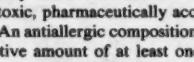
Filed Feb. 10, 1983, Ser. No. 465,669
Claims priority, application United Kingdom, Feb. 17, 1982, 8204634
Int. Cl.³ A61K 31/505; C07D 487/04
U.S. Cl. 514—250 18 Claims

1. A compound selected from the group consisting of the formula



I

wherein R_1 is selected from the group consisting of —OH, non-toxic, pharmaceutically acceptable cation of metals and organic bases, alkoxy of 1 to 5 carbon atoms, hydrazino and 1H-tetrazol-5-yl-amino, A is selected from the group consisting of



R_2 is selected from the group consisting of hydrogen and alkyl of 1 to 5 carbon atoms and R_3 and R_4 are individually selected from the group consisting of hydrogen, halogen and alkyl or alkoxy of 1 to 5 carbon atoms with the proviso that when R_1 is alkoxy of 1 to 5 carbon atoms, R_2 is not hydrogen and their non-toxic, pharmaceutically acceptable acid addition salts.

7. An antiallergic composition comprising an antiallergically effective amount of at least one compound of claim 1 and a pharmaceutical carrier.

13. A method of treating allergic symptoms in warm-blooded animals comprising administering to warm-blooded animals an antiallergically effective aamount of at least one compound of claim 1.

4,510,144

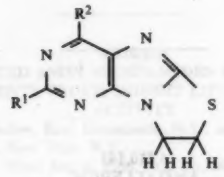
METHODS OF IMPARTING IMMUNOMODULATING ACTIVITY WITH DIHYDROTHIAZOLO PURINE DERIVATIVES

John W. Hadden, New York, N.Y.; Lionel N. Simon, Santa Ana, Calif., and Alfredo Giner-Sorolla, Riverside, Conn., assignors to Newport Pharmaceuticals International, Newport Beach, Calif.

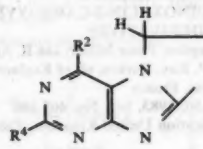
Division of Ser. No. 296,557, Aug. 26, 1981, Pat. No. 4,387,226.
This application Sep. 30, 1982, Ser. No. 429,421
Int. Cl.³ A61K *31/52*
U.S. Cl. 514—257 **13 Claims**

1. A method of imparting immunomodulating activity comprising administering to a mammal an effective amount for such purpose of a compound having one of the formula

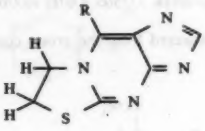
I



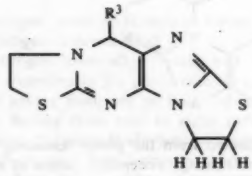
II



III



IV



where R^1 is hydrogen, lower alkylthio, lower alkylsulfinyl, amino or halogen, R^2 is hydroxy, lower alkylthio, halogen, amino, or mercapto, R is hydroxy, mercapto, lower alkylthio or halogen, and R^3 is hydroxy, mercapto, lower alkylthio, halogen, or amino.

4,510,145

METHOD FOR INHIBITING CONTRACTION OF OPHTHALMIC WOUNDS OR INCISIONS

Ronald A. Schacher, P.O. Box 145, Denison, Tex. 75020

Division of Ser. No. 212,315, Dec. 2, 1980, Pat. No. 4,390,542.
This application Mar. 21, 1983, Ser. No. 477,009
Int. Cl.³ A61K *31/485, 31/52, 31/445, 31/365*
U.S. Cl. 514—415 **1 Claim**

1. A method for inhibiting contraction of an ophthalmic wound or incision which comprises administering to said wound or incision a pharmaceutically acceptable composition comprising an ophthalmological carrier and an effective amount of a smooth muscle relaxant to inhibit the contraction of myofibroblasts present in the wound or incision, and wherein said method additionally comprises administering to the wound or incision after said administration of the smooth muscle relaxant, an effective amount of a pharmaceutically acceptable composition comprising an ophthalmological carrier and a smooth muscle stimulant, to re-establish a desired configuration in the wound or incision, wherein said smooth muscle stimulant is serotonin.

4,510,146

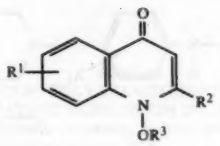
GROWTH-PROMOTING FEED AND DRINK

Peter Lechtken, Frankenthal; Axel Nüerrenbach, Gruenstadt, and Juergen Schole, Wechmark, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

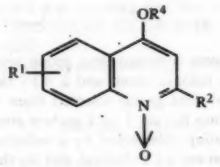
Filed May 10, 1982, Ser. No. 376,586
Claims priority, application Fed. Rep. of Germany, May 15, 1981, 3119384
Int. Cl.³ A61K *31/47*
U.S. Cl. 514—312 **3 Claims**

1. A growth-promoting feed or drink which in addition to a conventional feed premix, feed concentrate or feed, or water, as the main constituent contains from 0.5 to 500 ppm of a compound of the formula Ia or Ib

Ia



Ib



where R^1 is hydrogen, low molecular weight alkyl or alkoxy, or halogen, R^2 is low molecular weight alkyl and R^3 and R^4 are hydrogen, a low molecular weight aliphatic radical or a benzyl radical.

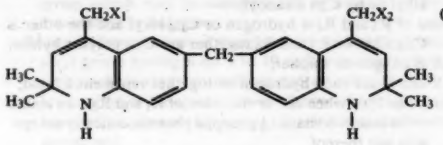
4,510,147

COMPOSITIONS FOR AND MEDICAL USE OF WATER-SOLUBLE DERIVATIVES OF 6,6-METHYLENE-BIS-(2,2,4-TRIMETHYL-1,2-DIHYDROQUINOLINE)

Vilmos Bär; József Böszörmenyi; Péter Richter; Jenö Mercz, and Tamás Rozsnyai, all of Budapest, Hungary, assignors to Material Vegyipari Szövetkezet and Human Oltoanyagtermelo Es Kutato Intezet, both of Budapest, Hungary, a part interest

Division of Ser. No. 164,526, Jul. 2, 1980, Pat. No. 4,356,306.
This application May 14, 1982, Ser. No. 378,256
Claims priority, application Hungary, Jul. 6, 1979, MA 3172
Int. Cl.³ A61K *31/47*
U.S. Cl. 514—314 **3 Claims**

1. A pharmaceutical composition which comprises a pharmaceutically effective amount of a compound of the Formula (I)



(I)

wherein X_1 and X_2 are each hydrogen, $—SO_3Me$, or $—SO_2NH_2$ and
wherein Me is an alkali metal ion, but where one of X_1 and X_2 is always different from hydrogen, and a pharmaceutically acceptable inert carrier.

2. A method of treating an animal subject for atheriosclerosis which comprises the step of administering a pharmaceutically effective amount of the compound of the Formula (I) defined in claim 1, to said animal subject.

3. A method of treating an animal subject affected by free-radical action which comprises administering a N-nitrosoamine-protective, free radical inhibiting effective amount of the compound in the formula I defined in claim 1.

4,510,148
2-HETEROCYCLIC-1,3-BIS(1H-1,2,4-TRIAZOL-1-YL)-PROPAN-2-OLS AS ANTIFUNGAL AGENTS

Kenneth Richardson, Canterbury, and Kelvin Cooper, Ramsgate, both of England, assignors to Pfizer Inc., New York, N.Y.

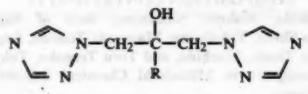
Filed May 27, 1983, Ser. No. 499,073

Claims priority, application United Kingdom, Jun. 12, 1982, 8217114

Int. Cl.³ A01N *43/64, 43/78;* C07D *401/14, 405/14*

U.S. Cl. 514—340 **2 Claims**

1. Compound of the formula



and the pharmaceutically acceptable salts thereof, wherein R is 5-chloro-2-pyridyl.

2. A pharmaceutical composition comprising a compound as claimed in claim 1 together with a pharmaceutically acceptable diluent or carrier.

4,510,149
N-IMIDAZOLYL DERIVATIVES CONTAINING NAPHTHALENE OR INDENE NUCLEUS

Paolo Cozzi; Germano Carganico; Antonio Pillan, all of Milan, and Umberto Branzoli, Pavia, all of Italy, assignors to Farmitalia Carlo Erba S.p.A., Milan, Italy

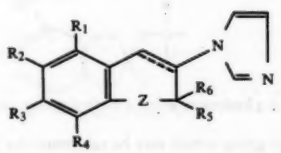
Filed Jul. 1, 1983, Ser. No. 510,358

Claims priority, application United Kingdom, Jul. 5, 1982, 8219412

Int. Cl.³ A61K *31/44;* C07D *233/56*

U.S. Cl. 514—341 **34 Claims**

1. A compound of formula (I)

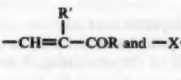


(I)

wherein
the symbol represents a single or a double bond;
Z completes a single bond or is a $—CH_2—$ group;
each of R_1, R_2, $R_3$and R_4, which may be the same or different, is
(a) hydrogen; hydroxy; halogen; cyano; C_1–C_6 alkyl; C_1–C_6alkoxy; a C_2–C_4 acyl or C_2–C_4 acylamino group; —SR',

$—CH_2OR'$, —COR or $—CH_2COR$, wherein R is —OR' or

and each of R'0 and R", being the same or different, is hydrogen or C_1–C_6 alkyl; or
(b) one of R_1, R_2, R_3 and R_4 is 5-tetrazolyl or a group selected from $—COCH_2OR'$,



wherein R, R' and R" are as defined above, and X is —O—, —S— or —NH—, and the others are as defined above under (a);
one of R_5 and R_6 is hydrogen and the other is hydrogen, C_1–C_6 alkyl, C_3–C_6 cycloalkyl, or a phenyl or pyridyl ring, wherein the phenyl or pyridyl ring is unsubstituted or substituted by one to three substituents chosen from hydroxy and C_1–C_4 alkoxy; or a pharmaceutically acceptable salt thereof.

4,510,150
PHARMACEUTICAL COMPOSITIONS EFFECTIVE AGAINST CORONARY HEART DISEASE AND HYPERTENSION

Richard Berthold, Bottmingen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 302,900, Sep. 16, 1981, abandoned. This application Aug. 1, 1983, Ser. No. 519,002

Claims priority, application United Kingdom, Sep. 18, 1980, 8030226

Int. Cl.³ A61K *31/44*

U.S. Cl. 514—338 **18 Claims**

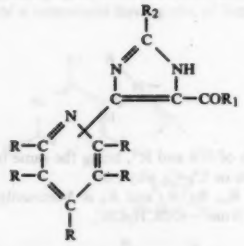
11. A method of treating coronary heart disease or hypertension which comprises administering to a subject in need of such treatment a composition comprising as the active agents: (1) as component (A), a member selected from the group consisting of 4-(2,1,3-benzoxadiazol-4-yl)-1,4-dihydro-2,6-dimethyl-pyridine-3,5-dicarboxylic acid diethylester, 4-(2,1,3-benzothiadiazole-4-yl)-1,4-dihydro-2,6-dimethyl-pyridine-3,5-dicarboxylic acid dimethylester and 4-(2,1,3-benzoxadiazol-4-yl)-1,4-dihydro-2,6-dimethyl-3-isopropyloxy carbonylpyridine-5-carboxylic acid methyl ester; and (2) as component (B), a β-adrenoceptor blocking agent possessing some degree of intrinsic sympathomimetic activity, the sum of components (A) and (B) in said composition being present in a therapeutically effective amount.

4,510,151
PYRIDINYLIMIDAZOLE PHARMACEUTICAL COMPOSITION

Thomas D. Lee, Scarsdale, N.Y., assignor to USV Pharmaceutical Corporation, Tarrytown, N.Y.

Filed Feb. 10, 1984, Ser. No. 578,918
Int. Cl.³ A61K *31/44*
U.S. Cl. 514—341 5 Claims

1. A pharmaceutical composition useful for treatment of congestive heart failure and hypertension comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound selected from the group consisting of pyridinylimidazoles of the formulae:



and pharmaceutically acceptable acid addition salts thereof,

wherein the imidazole radical is substituted on one of the R substituents and each of the remaining R substituents is hydrogen,

R_1 is hydroxy, amino, methoxy or ethoxy, and

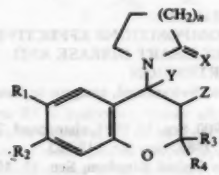
R_2 is hydrogen, halo, or hydroxy.

4,510,152
ANTIHYPERTENSIVE CHROMENES AND CHROMANS

Erol A. Faruk, Enfield, England, assignor to Beecham Group p.l.c., England

Filed Apr. 21, 1983, Ser. No. 487,098
Claims priority, application United Kingdom, Apr. 28, 1982, 8212358
Int. Cl.³ A61K *31/445, 31/40;* C07D *405/04*
U.S. Cl. 514—321 9 Claims

1. A compound of formula (I)



(I)

wherein:

either one of R_1 and R_2 is hydrogen and the other is selected from the class of C_{1-6} alkylcarbonyl, C_{1-6} alkoxycarbonyl, C_{1-6} alkylcarbonyloxy, C_{1-6} alkylhydroxymethyl, nitro, cyano, chloro, trifluoromethyl, C_{1-6} alkylsulphinyl, C_{1-6} alkylsulphonyl, C_{1-6} alkoxysulphinyl, C_{1-6} alkoxysulphonyl, C_{1-6} alkylcarbonylamino, C_{1-6} alkoxycarbonylamino, C_{1-6} alkyl-thiocarbonyl, C_{1-6} alkoxy-thiocarbonyl, C_{1-6} alkyl-thiocarbonyloxy, C_{1-6} alkyl-thiolmethyl, formyl or aminosulphinyl, aminosulphonyl or aminocarbonyl, the amino moiety being optionally substituted by one or two C_{1-6} alkyl groups, or C_{1-6} alkylsulphinylamino, C_{1-6} alkylsulphonylamino C_{1-6} alkoxysulphinylamino or C_{1-6} alkoxysulphonylamino or ethylenyl terminally substituted by C_{1-6} alkylcarbonyl, nitro or cyano, or —C(C_{1-6} alkyl)-NOH or —C(C_{1-6} alkyl)NNH_2, or one of R_1 and R_2 is nitro, cyano or C_{1-3} alkylcarbonyl and the other is methoxy or amino optionally substituted by one or two C_{1-6} alkyl or by C_{2-7} alkanoyl;

one of R_3 and R_4 is hydrogen or C_{1-4} alkyl and the other is C_{1-4} alkyl or R_3 and R_4 together are C_{2-5} polymethylene;

X is oxygen or sulphur;

Y and Z are each hydrogen or together represent a bond;

n is 1 or 2; or when one or the other of R_1 and R_2 is an amino or an amino-containing group, a pharmaceutically acceptable salt thereof.

9. A method of treatment of hypertension in mammals including humans comprising the administration of an antihypertensive effective amount of a compound according to claim 1 or a pharmaceutically acceptable salt thereof to the sufferer.

4,510,153
TREATMENT OF PANIC DISORDERS WITH ADINAZOLAM

James H. Coleman, Cumberland, R.I., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 418,923, Sep. 16, 1982, abandoned. This application Aug. 4, 1983, Ser. No. 520,228
Int. Cl.³ A61K *31/41*
U.S. Cl. 514—220 13 Claims

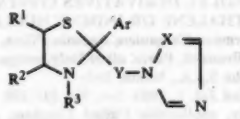
1. A process for preventing recurrent panic attacks comprising the administration to a human subject in need of such treatment, in unit dosage form, from about 0.01 mg to about 0.4 mg/kg body weight of 8-chloro-1-[(dimethylamino)methyl]-6-phenyl-4H-s-triazolo[4,3a][1,4]benzodiazepine or the pharmacologically acceptable acid addition salt or a (5) N-oxide thereof in association with a pharmaceutical carrier.

4,510,154
THIAZOLIDINE COMPOUND AND FUNGICIDAL COMPOSITION CONTAINING IT

Kenji Yoshida; Makoto Nakazawa, both of Sagamihara; Toyohiko Shike, Yokohama; Masayuki Tomida, Sagamihara; Masataka Tsuda, Machida, and Toru Teraoka, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Filed Apr. 13, 1983, Ser. No. 484,502
Claims priority, application Japan, Apr. 21, 1982, 57-66720; Oct. 19, 1982, 57-183346
Int. Cl.³ C07D *417/06;* A01N *43/78*
U.S. Cl. 514—365 12 Claims

1. A thiazolidine compound represented by the formula I or its acid addition salt



(I)

wherein

X is —CH= or —N=;

Y is $—CH_2—CH_2—$ or

wherein R is a hydrogen atom, a methyl group, or an ethyl group;

Ar is a phenyl group which may be substituted by halogen, lower alkyl, lower alkoxy, phenyl, trifluoromethyl, a thienyl group or a naphthyl group;

R^1 is a hydrogen atom, a straight chain or branched chain

alkyl group having from 1 to 10 carbon atoms or a phenyl group which may be unsubstituted or substituted by a lower alkyl or halogen;

R^2 is a hydrogen atom, a straight chain or branched chain alkyl group having from 1 to 10 carbon atoms, a phenyl group which may be unsubstituted or substituted by a lower alkyl or halogen, a lower alkoxycarbonyl group, a lower alkylcarbamoyl group or a lower alkenylcarbamoyl group; and

R^3 is a hydrogen atom, a lower alkyl group, a lower carboxyacyl group, a lower alkylcarbamoyl group, a lower alkylthiocarbamoyl group or a phenylcarbamoyl group.

4,510,155

6(OR 5)-HYDROXYBENZOTHIAZOLE-2-SULFONAMIDE-O-SULFATE SALTS FOR THE TOPICAL TREATMENT OF ELEVATED INTRAOCULAR PRESSURE

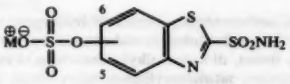
Robert L. Smith, and Samuel L. Graham, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jun. 2, 1983, Ser. No. 500,607

Int. Cl.³ C07D 277/80; A61K 31/425

U.S. Cl. 514—276 **10 Claims**

1. A compound of the formula:



wherein $M^{\oplus}$ is an ophthalmologically acceptable cation selected from sodium, potassium, ammonium, tetra(C_{1-4}alkyl-)ammonium, pyridinium, imidazolium, pralidoxime or thiamine.

4,510,156

BISINDOLYL ALKYLENE UREAS LIPID ABSORPTION-INHIBITING AGENTS AND THEIR USE THEREAS

Hans-Joachim Kabbe, Leverkusen; Hans-Peter Krause, and Rüdiger Sitt, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

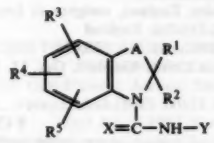
Division of Ser. No. 206,314, Oct. 31, 1980, abandoned. This application Feb. 10, 1982, Ser. No. 347,599

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1979, 2945238; Aug. 8, 1980, 3030024

Int. Cl.³ A61K 31/40; C07D 403/12, 209/26

U.S. Cl. 514—415 **15 Claims**

1. A pharmaceutical composition containing as an active ingredient a hypolipidemically effective amount of a compound which is an alkylurea of the formula



(I)

in which

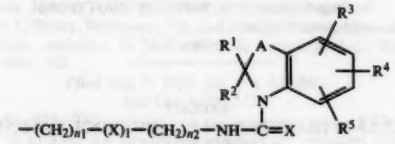
X denotes oxygen or sulphur and

A represents

in which

R′ and R″ are identical or different and each denote a hydrogen atom or an alkyl radical with 1 to 4 carbon atoms,

Y represents R or a radical



in which

n_1 and n_2 denote integers from 3 to 9 and

1 denotes 0 or 1 and

in which

X and A are as defined above and in which all R–R5 radicals are as follows:

R represents a straight-chain, branched, cyclic, saturated or mono-unsaturated aliphatic hydrocarbon radical with 4 to 20 carbon atoms, which is optionally substituted by halogen, trifluoromethyl, hydroxyl or alkoxy or alkoxycarbonyl, with, in each case, 1 to 6 carbon atoms in the alkoxy radical, or by phenyl, the phenyl radical in turn optionally carrying 1 or 2 substituents selected from halogen, trifluoromethyl, hydroxyl, alkyl with 1 to 2 carbon atoms and alkoxy with 1 to 2 carbon atoms

R^1 represents a hydrogen atom or a non-steric-hinderable

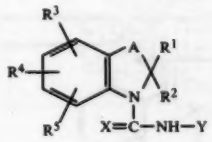
C_1–C_6 alkyl radical,

R^2 represents a non-steric hinderable C_1–C_6 alkyl radical and

R^3, R^4 and R^5 are identical or different and each represent a hydrogen or halogen atom or a hydroxyl, cyano, C_1–C_6 alkyl, C_1–C_6 alkoxy, (C_1–C_6 alkoxy)-carbonyl, (C_1–C_6-alkyl)-carbonyl, a phenyl or phenoxy radical, optionally substituted by 1 to 2 substituents selected from halogen, trifluoromethyl, hydroxyl, C_1–C_2-alkyl or C_1–C_2-alkoxy

in admixture with an inert pharmaceutical carrier.

11. An alkylurea derivative of the formula



(I)

in which

Y represents R and R represents a straight-chain, branched or cyclic alkyl or alkenyl radical, with in each case 6 to 18 carbon atoms, the said alkyl and alkenyl groups optionally being substituted by chlorine, bromine, fluorine, alkoxy with 1 to 4 carbon atoms, or by phenyl,

R^1 and R^2 are identical or different and each represent an alkyl radical with 1 or 2 carbon atoms,

R^3, R^4 and R^5 are identical or different and each represent a hydrogen, chlorine, or bromine atom or a trifluoromethyl, alkyl,

or alkoxy radical, the said alkyl and alkoxy radicals or moieties

each containing 1 to 4 carbon atoms, or represent a phenoxy or chlorophenoxy radical,

A represents

in which

R′ and R″ are identical or different and each denote a hydrogen atom or a methyl or ethyl radical, and X represents oxygen.

4,510,157

6,7,8,9-TETRAHYDRO-1H-BENZ(G)INDOL-8-AMINE DERIVATIVES

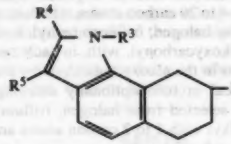
Andre A. Asselin, St. Laurent, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to Ayerst, McKenna & Harrison, Inc., Montreal, Canada

Filed Dec. 27, 1982, Ser. No. 453,306

Int. Cl.³ A61K *31/40*; C07D *209/56*

U.S. Cl. 514—411 **13 Claims**

1. A compound of the formula



(I)

in which R^1, R^2, R^3, R^4 and R^5 each is hydrogen or lower alkyl having 1 to 5 carbon atoms, or a therapeutically acceptable acid addition salt thereof.

4,510,158

2-PHENYLINDOLE DERIVATIVES, THEIR USE AS COMPLEMENT INHIBITORS

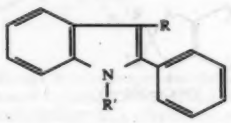
Denis M. Bailey, East Greenbush, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed Mar. 5, 1984, Ser. No. 586,377

Int. Cl.³ C07D *209/18*; A61K *31/40*

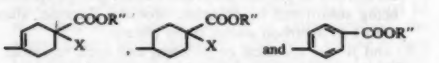
U.S. Cl. 514—415 **20 Claims**

1. A compound of the formula:



wherein:

R is selected from the group consisting of:



wherein R″ is hydrogen or lower-alkyl and X is hydrogen or —COOR‴, R‴ being hydrogen or lower-alkyl; and R′ is hydrogen or lower-alkyl;

or an alkali metal salt thereof.

4,510,159

(+)-CYANIDAN-3-OL DERIVATIVES, PHARMACEUTICAL PREPARATIONS THAT CONTAIN SUCH COMPOUNDS, AND THE USE OF THE LATTER TO TREAT LIVER OR VENOUS DISEASES

Alban I. Albert, Grand-Saconnex; Marc E. Ballenegger, Gimel, both of Switzerland; Jan C. Overeem, Scherpenzaal, Netherlands, and Robert G. Tyson, Prestatyn, Wales, assignors to Zyma SA, Nyon, Switzerland

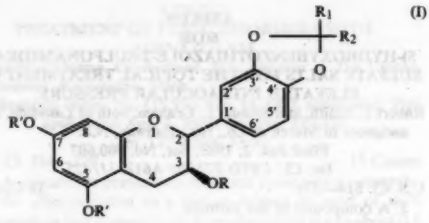
Filed May 31, 1983, Ser. No. 499,644

Claims priority, application United Kingdom, Jun. 1, 1982, 8215868

Int. Cl.³ A61K *31/36, 31/35*; C07D *311/62*

U.S. Cl. 514—456 **11 Claims**

1. A compound of the formula



(I)

wherein

R and R′ independently represent hydrogen; lower alkyl which is unsubstituted or substituted by hydroxy, oxo, amino, imino, di-lower alkylamino, halo, hydroxyimino, phenylimino, nitrophenylimino, acetylimino, cyano, carboxy or lower alkylsulfinyl; lower alkenyl which is unsubstituted or substituted by carboxy, lower alkylcarboxy, nitro, methylsulfinyl or acetoxymethylthio; lower alkynyl; cycloalkyl-lower alkyl wherein cycloalkyl has 3 to 6 ring carbon atoms; cycloalkenyl-lower alkyl wherein cycloalkenyl has 5 to 6 carbon atoms; phenyl or phenyl-lower alkyl which are unsubstituted or substituted by halo, lower alkyl, lower alkoxy, nitro or di-lower alkylamino; carboxy substituted lower alkanoyl; lower alkenoyl; carboxy substituted lower alkenoyl; trifluoroacetyl; or benzoyl or benzoyl substituted by hydroxy, halo, lower alkyl or lower alkoxy;

R_1 and R_2 independently represent phenyl or phenyl substituted by hydroxy, halo, lower alkyl, lower alkoxy, nitro, lower alkoxycarbonyl, lower alkanoyloxy, or dimethylamino; or R_1 and R_2 together represent biphenyl-2,2′-ylene which is unsubstituted or substituted by hydroxy, halo, lower alkyl, lower alkoxy, nitro, lower alkoxycarbonyl, lower alkanoyloxy or dimethylamino,

and therapeutically acceptable salts thereof.

3. A pharmaceutical composition for the treatment of liver or venous diseases containing an effective amount of a compound according to claim 1 and a pharmaceutical carrier.

4,510,160

INSECTICIDAL PRODUCT AND PREPARATION THEREOF

Michael J. Robson, Berkshire, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Sep. 26, 1983, Ser. No. 535,626

Claims priority, application United Kingdom, Oct. 11, 1982, 8228983

Int. Cl.³ A01N *53/00*; C07C *121/75*

U.S. Cl. 514—521 **8 Claims**

1. The enantiomeric pair of isomers represented by (S)-α-cyano-3-phenoxybenzyl 1R,cis-3-(Z-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate and (R)-α-cyano-3-phenoxybenzyl 1S,cis-3-(Z-2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate

in racemic proportions and substantially free from any other isomer of α-cyano-3-phenoxybenzyl 3-(2-chloro-3,3,3-trifluoroprop-1-en-1-yl)-2,2-dimethylcyclopropane carboxylate.

4. An insecticidal and acaricidal composition comprising an insecticidally and acaricidally effective amount of the enantiomeric pair of isomers according to claim 1 in association with an agriculturally and horticulturally acceptable diluent or carrier material.

4,510,161

ANTIHYPERTENSIVE AGENTS AND PROCESS FOR PRODUCING THE SAME

Akira Fujimaki, Koganei, Japan, assignor to Zaidan Hojin Minsei Kagaku Kyokai, Koganei, Japan

Filed Oct. 20, 1982, Ser. No. 435,350
Claims priority, application Japan, Oct. 22, 1981, 56-169157
Int. Cl.³ A61K *35/78*
U.S. Cl. 514—54 **18 Claims**

1. A process for extraction and purification of a substance referred to as OSG having the following physicochemical properties:

(1) OSG is a slightly hygroscopic, white or slightly yellow powder;

(2) OSG exhibits a color reaction of sugar in α-naphthol reaction and orcinol reaction;

(3) OSG is negative to TCA reaction and ninhydrin reaction;

(4) OSG is positive in glycyrrhizin reaction;

(5) when OSG is analyzed by a paper chromatograph method no spots consistent with those of known sugars are observed;

(6) a hydrolyzate of OSG exhibits a spot consistent with that of glucose or sorbose and exhibits a retention time shorter than that of glucuronic acid; and

(7) OSG is confirmed to comprise polymeric sugars; having antihypretensive activity from a vegetable oil selected from the group consisting of soybean oil, corn oil, rape seed oil and cotton seed oil, which comprises

(a) extracting water-soluble components from the vegetable oil, thereby to obtain a first aqueous extract;

(b) concentrating the aqueous extract;

(c) adding alcohol to the resulting extract to prepare an alcoholic solution having an alcohol concentration of 85% or higher, thereby precipitating the insoluble matter;

(d) then removing the precipitate; and

(e) thereafter removing the alcohol to obtain an aqueous extract product, which contains said substance.

4,510,162

COMPOSITION FOR ABSORBING OXYGEN AND CARRIER THEREFORE

Jerry W. Nezat, Kalispell, Mont., assignor to Creative Research & Development, Inc., Whitefish, Mont.

Filed Mar. 7, 1983, Ser. No. 473,097
Int. Cl.³ C09K *15/00*; A23L *3/00*
U.S. Cl. 426—124 **19 Claims**

1. An oxygen absorbing composition mounted on a carrier for carrying the composition and said carrier being capable of being placed in a closable container for removing oxygen from the space within the container, said oxygen absorbing composition comprising iron particles and yeast mixed together with moisture in an amount sufficient to dampen the composition.

4,510,163

PROCESS FOR PREPARING A REHYDRATABLE DICED FROZEN FOOD PRODUCT

Frederik Gejl-Hansen, Aarhus, Denmark, assignor to Nestec S.A., Vevey, Switzerland

Filed Jul. 9, 1982, Ser. No. 396,836
Claims priority, application European Pat. Off., Aug. 28, 1981, 81106716.4
Int. Cl.³ A23L *3/16*; A23B *4/06*; A23K *1/18*
U.S. Cl. 426—241 **6 Claims**

1. A process for preparing a readily rehydratable diced frozen food product which upon rehydration is ready to eat and is resistant to crumbling comprising binding a mixture of food ingredients to form a compact solid foodstuff, treating the foodstuff with microwaves to remove water present in the foodstuff in an amount of from 15 to 25% by weight based on the total weight of the foodstuff, dicing the foodstuff before or after the microwave treatment, and then freezing the diced, microwave treated foodstuff.

4,510,164

PROCESS FOR PRODUCING INTERMEDIATE MOISTURE QUICK-COOKING BEANS

Lorie L. Staley, Baltimore, Md. and Joaquin Pelaez, Plymouth, Minn., assignors to McCormick & Company, Inc., Hunt Valley, Md.

Filed Sep. 7, 1983, Ser. No. 530,058
Int. Cl.³ A23L *1/20*
U.S. Cl. 426—331 **4 Claims**

1. A process for producing intermediate moisture quick-cooking and storage-stable whole beans comprising:

heating dried beans under about 15 psi to about 50 psi of pressure in the presence of a humectant solution comprising an aqueous solution containing 4.0–7.5 weight percent of a sugar or polyglycol, 4.0–9.0 weight percent of a salt, 2.0–3.0 weight percent propylene glycol and 0.3–0.6 weight percent potassium sorbate, for a period of time ranging from about 1.5 to about 4.0 hours at a temperature ranging from about 100° C. to about 140° C., to thereby increase the moisture level of said beans to about 50–60 percent;

reducing the moisture level of said beans from about 50–60% to an intermediate level of about 30–40 percent; and

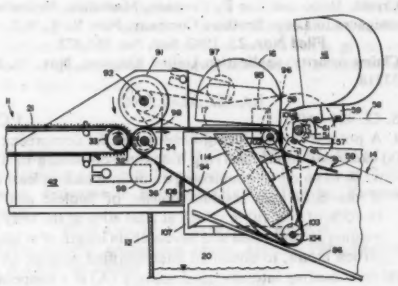
packaging the resulting intermediate moisture level whole beans in a low value vapor transmission container.

4,510,165

TACO SHELL FORMING AND COOKING METHOD

Andrew A. Caridis, Foster City; Clark K. Benson, Millbrae, and Lawrence F. Klein, Hillsborough, all of Calif., assignors to Heat and Control, Inc., So. San Francisco, Calif.

Continuation of Ser. No. 332,743, Dec. 21, 1981, abandoned.
This application Feb. 10, 1984, Ser. No. 578,323
Int. Cl.³ A23L *1/01, 1/10*; A21C *11/00*
U.S. Cl. 426—439 **13 Claims**



1. A method of rapidly and continuously converting substantially flat uncooked tortillas into cooked substantially U-shaped taco shells, comprising the steps of: moving a plurality of closely adjacent molds at a set rate of conveyance toward a forming zone, each adjacent pair of said molds presenting cooperating convex leading and concave trailing surfaces; quickly reversing the direction of movement of said adjacent molds so as to instantaneously create in rapid succession a series of repeating angular window-like openings between the adjacent convex and concave surfaces of said closely adjacent

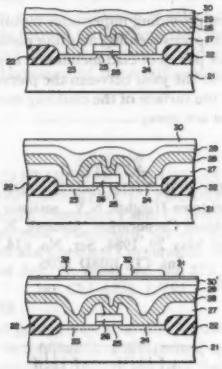
cure the flattened organic material, thereby converting the flattened organic material into a cured film which is not deformed by heat and energy beams.

8. A method for patterning a functional structure having uneven surface formed on a semiconductor substrate comprising the steps of:

forming a first film on said uneven surface of the functional structure;

applying a film-forming organic material capable of being cured by energy beams and exhibiting fluidity by heat on the first film surface;

fluidizing the organic material by applying heat to the applied organic material, thereby substantially flattening the surface of the organic material;



irradiating energy beams to the flattened organic material to cure the flattened organic material, thereby converting the flattened organic material into a second film which is not deformed by heat and energy beams;

forming a first pattern comprising a resist on the surface of said second film;

selectively etching said second film using said first pattern as a mask, thereby forming a second pattern;

selectively etching said first film using said second pattern as a mask, thereby forming a third pattern; and

patterning said functional structure using said third pattern as a mask.

4,510,174

METHOD OF MANUFACTURING A THIN LAYER DETECTOR FOR AN INTEGRATING SOLID STATE DOSIMETER

Georg Holzapfel, Berlin, and Jan Lesz, Brunswick, both of Fed. Rep. of Germany, assignors to Georg Dr. Holzapfel, Berlin, Fed. Rep. of Germany

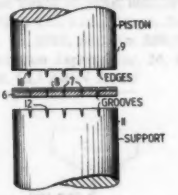
Filed Jul. 12, 1983, Ser. No. 513,022

Claims priority, application Fed. Rep. of Germany, Jul. 12, 1982, 3226378

Int. Cl.³ G01T *1/11;* B05D *5/00*

U.S. Cl. 427—65 **21 Claims**

1. A method of manufacturing a thin layer detector for solid state thermoluminescence dosimeters comprising the steps of: providing a substrate with suitably prepared surface; depositing a layer of a powder of a suitable thermoluminescent material on said prepared surface of the substrate; and simultaneously applying high pressure and elevated temperature to the powder layer at pressure and temperature values sufficient to cause plastic flow of the powder grains and physico-chemical bonding of the powder material with said surface of the substrate, whereby a thin hot-pressed layer of the thermoluminescent material is formed on and bonded to said surface of said substrate.



4,510,175

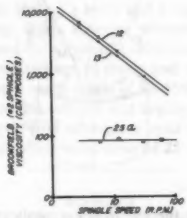
NEWTONIAN CERAMIC SLIP AND PROCESS FOR USING

Ian Burn, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jun. 9, 1983, Ser. No. 502,878

Int. Cl.³ B05D *5/12;* H01G *13/00*

U.S. Cl. 427—79 **1 Claim**



1. A method for making a monolithic ceramic capacitor comprising:

(a) dispersing a ceramic powder, having an average particle size from 0.5 to 1.5 μm, in a liquid vehicle consisting essentially of a solvent of a non-halogenated hydrocarbon plus 0–70% by weight of an alcohol, having dissolved therein a resin binder and a plasticizer, to form a water-insensitive Newtonian slip having a Brookfield viscosity of less than 700 centipoises over the range of 3 to 30 revolutions per minute of a number 2 Brookfield spindle;

(b) providing a falling sheet of said Newtonian slip;

(c) passing a flat porous substrate horizontally through said falling sheet to coat said substrate with a first level layer of said slip, and drying said first layer;

(d) depositing film patches of an electroding ink in the pattern of a matrix on the surface of said first layer creating ink bumps on said first layer surface;

(e) passing said substrate again through said falling sheet to deposit another level layer of said slip over said electroded first layer, said second level layer flowing and leveling to acquire an upper surface that is planar and free of irregularities reflecting said pattern of the underlying ink, and drying said second level layer;

(f) repeating steps (d) and (e) as many times as is desired to produce a stack of dried level slip layers interleaved by patterns of electroding ink;

(g) separating said stack into pieces each having at least one buried electrode and at least another electrode extending respectively to two-spaced apart surface portions of said each piece;

(h) firing said pieces to burn out said binder and sinter said

ceramic to maturity to transform said pieces to monolithic ceramic capacitor bodies; and

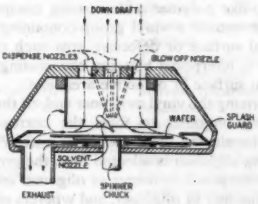
(i) applying two terminations to each of said bodies at said two surface portions, respectively, to form monolithic ceramic capacitors.

4,510,176

REMOVAL OF COATING FROM PERIPHERY OF A SEMICONDUCTOR WAFER

John D. Cuthbert, Bethlehem, and Nicholas A. Soos, Lower Macungie Township, Lehigh County, both of Pa., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 26, 1983, Ser. No. 535,916
Int. Cl.³ B05D 5/12; B05C 11/12
U.S. Cl. 427—82 **2 Claims**



1. Method for the manufacture of semiconductor wafers comprising the steps of:

spinning the semiconductor wafer,

applying a coating material to the spinning wafer,

directing a fluid onto the periphery of the spinning wafer to remove the coating material at the periphery of the wafer, and

creating a controlled positive flow of gas onto the surface of the wafer while the wafer is spinning, thus causing a centrifugal flow of gas over the surface of the wafer and across the periphery of the wafer and thereby carrying debris of the aforementioned fluid and/or loose material generated at the periphery away from the center of the spinning wafer, and

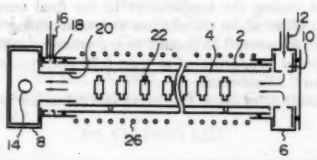
establishing a physical barrier separating the positive flow of gas onto the surface of the wafer from the flow of gas that crosses the periphery of the wafer.

4,510,177

METHOD AND APPARATUS FOR VAPOR PHASE DEPOSITION

Yuji Furumura, and Takeshi Nishizawa, both of Kawasaki, Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Aug. 4, 1982, Ser. No. 405,082
Claims priority, application Japan, Aug. 8, 1981, 56-124515
Int. Cl.³ H01L 21/365, 21/383
U.S. Cl. 427—85 **11 Claims**



1. A method of vapor phase deposition for growing a semiconductor layer on a plurality of wafers having major surfaces and arranged in a reaction tube having a longitudinal axis, comprising the steps of:

(a) arranging the plurality of wafers in a deposition region in the reaction tube such that each of the major surfaces of the plurality of wafers is parallel to the others and is transverse to the longitudinal axis of the reaction tube;

(b) feeding a main gas flow containing a reaction gas and an impurity gas into a first end of the reaction tube;

(c) passing the main gas flow through the deposition region in a first direction along the longitudinal axis of the reaction tube from the first end to a second end of the reaction tube;

(d) reducing the pressure inside the reaction tube;

(e) heating the plurality of wafers at a temperature at which the impurity doped semiconductor layer is grown, the temperature in the reaction tube being maintained between two values, such that a first temperature exists at the first end of the reaction tube and a second temperature, greater than that of the first temperature, exists at the second end of the reaction tube, the temperature in the reaction tube gradually increasing in a direction from the first end to the second end; and

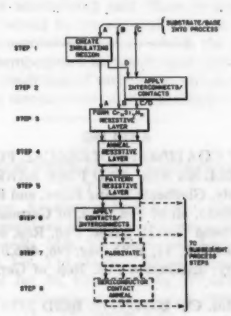
(f) introducing an auxiliary gas, containing an impurity gas, into the reaction tube at a position downstream of the deposition region at an introduction rate substantially lower than the feeding rate of the main gas flow, there by diffusing the impurity gas of the auxiliary gas in a second direction opposite that of the first direction.

4,510,178

THIN FILM RESISTOR MATERIAL AND METHOD

Wayne M. Paulson, Paradise Valley, and David W. Hughes, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 279,130, Jun. 30, 1981, Pat. No. 4,392,992.
This application Feb. 14, 1983, Ser. No. 466,234
Int. Cl.³ H01C 17/12
U.S. Cl. 427—94 **19 Claims**



1. A process for fabricating a thin film resistor material on a surface of a substrate, comprising:

exposing said surface to one or more sources of Cr, Si, and nitrogen;

forming on said surface a thin film comprising a compound of Cr, Si, and nitrogen derived from said sources;

annealing said thin film to produce said resistor material.

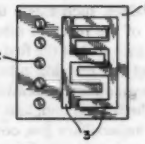
4,510,179
ELECTRODE ON HEAT-RESISTING AND ISOLATING SUBSTRATE AND THE MANUFACTURING PROCESS FOR IT

Katsuhiko Honjo, Takatsuki; Hiromitsu Taki, and Noriya Sato, both of Miyazaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 293,981, Aug. 18, 1981, abandoned. This application Jun. 30, 1983, Ser. No. 509,594

Int. Cl.³ C23C 3/02

U.S. Cl. 427—96 13 Claims



1. A process for the manufacture of an electrode on a heat-resisting and isolating substrate which comprises

applying on the substrate a paste comprising 5 to 30 weight percent of a metal material and an organic vehicle, said metal material containing 5 to 60 weight percent of a silver component and 95 to 40 weight percent of a base metal component containing at least one member selected from the group consisting of nickel, copper, aluminum, zinc, tin iron and cobalt,

heating the substrate containing the applied paste at a temperature of 350° to 600° C. to form on the substrate a metallic particle layer of 0.2 to 1 micron in thickness, where the organic vehicle in the paste is consumed, and

subsequently building up on the metallic particle layer by electroless plating an electrode of nickel or copper having a thickness of 0.5 to 20 microns,

whereby the base metal component improves the adhesive force and the electrical characteristics including dielectric constant and the tan δ of the electrode, and whereby the base metal component prevents the migration of the silver component thereby to improve the useful life of the electrode under humid conditions.

4,510,180
METHOD OF COATING GEOLOGICAL FORMATIONS AS WELL AS AIR- AND FIRE BARRIERS

Wolfgang Cornely, Gladbeck; Heinz Esser, and Rudolf Schmidt, both of Burscheid, all of Fed. Rep. of Germany, assignors to Bergwerksverband GmbH, Essen, Fed. Rep. of Germany

Filed Feb. 14, 1983, Ser. No. 466,010

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1982, 3205997

Int. Cl.³ B05C 1/16; B05D 5/10

U.S. Cl. 427—136 10 Claims

1. A method of coating geological formations as well as air- and fire barriers, comprising the steps of

providing an aqueous rubber or rubber-like dispersion; providing a dry hydraulic binding medium; and

spraying the aqueous rubber or rubber-like dispersions and the dry hydraulic binding medium simultaneously but via separate conduits by a pressure air onto an object to be coated.

4,510,181
METHOD FOR COATING METAL SURFACE

Toshimitsu Okuno; Yutaka Hori; Makoto Sunakawa, and Sadayuki Inagaki, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 28, 1983, Ser. No. 566,453

Claims priority, application Japan, Dec. 29, 1982, 57-228209

Int. Cl.³ B32B 35/00

U.S. Cl. 427—142 21 Claims

1. A method for coating a metal surface by forming a corrosion-protective layer on the metal surface or on defective areas of a corrosion-protective layer on a metal surface comprising:

(a) coating the metal surface, defective areas, or a coating material with a liquid material comprising a vinyl monomer and/or a vinyl group-containing oligomer;

(b) wrapping or bonding the coating material which is selected from the group consisting of a tape-like, sheet-like and chip-like polymerizable coating comprising a vinyl monomer and/or a vinyl group-containing oligomer, to the metal surface or defective area such that the liquid material is interposed between the coating material and the metal surface or defective area; and

(c) polymerizing the vinyl monomer and/or the vinyl group-containing oligomer to form the corrosion-protective layer; wherein the vinyl monomer and/or vinyl group-containing oligomer is selected from the group consisting of monofunctional monomer or oligomer and a polyfunctional monomer or oligomer; and wherein either the coating material or the liquid material contains a polymerization initiator and the material not containing the polymerization initiator contains a polymerization accelerator.

4,510,182
METHOD FOR THE PRODUCTION OF HOMOGENEOUS COATINGS OF TWO OR MORE METALS AND/OR METAL COMPOUNDS

Boy Cornils, Dinslaken; Bela Tihanyi; Jürgen Weber, both of Oberhausen; Werner DeWin, Dinslaken; Edwin Erben, Munich, and August Mühlratzer, Gliching, all of Fed. Rep. of Germany, assignors to Ruhrchemie Aktiengesellschaft and Maschinenfabrik Augsburg-Nurnberg, both of, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 410,796, Aug. 23, 1982, abandoned. This application Apr. 26, 1984, Ser. No. 604,085

Claims priority, application Fed. Rep. of Germany, Aug. 27, 1981, 3133871

Int. Cl.³ B05D 5/06

U.S. Cl. 427—162 17 Claims

1. A method for the production of homogeneous coatings of a substance comprising at least two components selected from metals and metal compounds on a substrate comprising depositing said substance from a liquid phase from dinuclear or polynuclear mixed metal compounds by heating said dinuclear or polynuclear compounds to a first temperature about 85–90% of a final temperature over a period of about 5 to about 20 minutes, then heating at a second temperature about 62 to about 72% of said final temperature for about 1½ to about 2½ hours, then raising the temperature to the final temperature over about 20 to about 40 minutes and maintaining the final temperature for about 1 to about 2 hours, whereby said coating exhibits optical properties of at least 0.70 absorption and no greater than 0.30 emission.

10. The method of claim 1 wherein said substance is selected from

$FeCo_3H(CO)_{12}$	Bis[μ-tricarbonylcobalt](tricarbonyl iron)(tricarbohydridocobalt) (3 Co—Co; 2 Fe—Co)
$(CO)_2C_5H_5FeMoC_5H_5(CO)_3$	Dicarbonyl-η-cyclopentadienyl (tricarbonyl-η-cyclopentadienylmolybdo)iron.
$(CO)_2C_5H_5FeMn(CO)_5$	Dicarbonyl-η-cyclopentadienyl (pentacarbonylmangano)iron

-continued

$FeCo_2(CO)_9S$	Cyclo-(tricarbonylferro)-bis (tricarbonylcobalt)(2 Co—Fe; Co—Co)-sulphide
$(CO)_5MnCo(CO)_4$	Pentacarbonyl(Tetracarbonyl-cobalto)manganese
$(CO)_5ReCo(CO)_4$	Pentacarbonyl(tetracarbonyl-cobalto)rhenium
$(CO)_3C_5H_5MoMn(CO)_5$	Tricarbonyl-η-cyclopentadi-enyl(pentacarbonyl-mangano)molybdenum
$(CO)_3C_5H_5WMn(CO)_5$	Tricarbonyl-η-cyclopentadi-enyl(pentacarbonyl-mangano)tungsten
$(CO)_3C_5H_5MoWC_5H_5(CO)_3$	Tricarbonyl-η-cyclopentadi-enyl(tricarbonyl-η-cyclopenta-dienyltungsto)molybdenum
$TlCo(CO)_4$	Thallium-tetracarbonyl-cobaltate
$InCo_3(CO)_{12}$	Indium-dodecacarbonyltri-cobaltate
$Ph_3PAuCo(CO)_4$	Tetracarbonyl[(triphenylphos-phan)auro]cobalt
$(CO)_2C_5H_5FeHgCo(CO)_4$	Mercury (dicarbonyl-η-cyclo-pentadienylferro)(tetracar-bonylcobalt)
$Me_2Sn[Co(CO)_3PPh_3]_2$	Dimethyltin-bis[tricarbonyl (triphenylphosphan)cobaltate]
$Ph_3GeFeC_5H_5(CO)_2$	Dicarbonyl-η-cyclopentadi-enyl(triphenylgermanium)-iron
$PbFe(CO)_4$	Lead-tetracarbonylferrate
$Bi_2Fe_5(CO)_{20}$	Dibismuth-didecacarbonyl-pentaferrate
$SbFe(CO)_4$	Antimony-tetracarbonylferrate
$Ph_3GeMn(CO)_5$	Pentacarbonyl(triphenylger-manium)manganese
$Ph_3SnCrC_5H_5(CO)_3$	Tricarbonyl-η-cyclopentadi-enyl(triphenylstannan) chromium
$Ph_3SnWC_5H_5(CO)_3$	Tricarbonyl-η-cyclopentadi-enyl(tri-phenylstannan)-tungsten
$(CO)_3C_5H_5MoSnMe_2Mn(CO)_5$	Dimethylstannin(pentacar-bonylmanganese) tricarbonyl-η-cyclopentadi-enylmolybdenum
$[Co(CH_3COCH_3)_6][FeCo_3(CO)_{12}]_2$	Hexaacetonecobalt-bis(dodeca-carbonyl)iron tricobaltate

Cobalt nickel citrate
Molybdic acid-cobalt citrate
Manganese-cobalt oxide-2-ethylhexanoaten
Chromium-nickel oxide-3-ethylhexanoate
Nickel-aluminum isopropylate
Manganese-aluminum isopropylate
Chromium-aluminum isopropylate.

4,510,183

METHOD FOR APPLYING WEAR-RESISTANT COATINGS ON WORKING SURFACES OF TOOLS AND DEVICES

Atilla Akyol, Bad Essen-Linne, Fed. Rep. of Germany, assignor to Rabewerk Heinrich Clausing, Bad Essen, Fed. Rep. of Germany

Filed Sep. 14, 1983, Ser. No. 532,242

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1982, 3234310

Int. Cl.³ B05D *1/22*

U.S. Cl. 427—185 **12 Claims**

1. A method for applying a wear-resistant coating to a working surface of an object which is to be exposed to wear, comprising the step of dipping said object in a bath of molten metal having unmolten hard metal carbide particles dispersed therein, whereby a coating of said molten metal and said hard metal carbide particles is formed on said working surface of said object.

4,510,184

PROCESS AND APPARATUS FOR BONDING PARTICULATE MATERIAL, IN PARTICULAR CHIPS

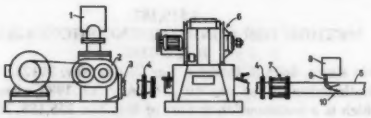
Hermann Winkler, Sassenburg, and Hanns I. Sachs, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Oct. 22, 1982, Ser. No. 436,132

Claims priority, application Fed. Rep. of Germany, Nov. 5, 1981, 3143895

Int. Cl.³ B05D *7/00*; B05B *17/00*; B05C *5/00*

U.S. Cl. 427—212 **7 Claims**



1. In a process for bonding particulate material by the spraying of bonding agent onto the material which material is in the form of a film of particles, the improvement wherein

(i) said particulate material is fed into a pneumatic material transport device at a first location,

(ii) said film of particles is uniformly diverted by at least one air conducting installation located within said pneumatic material transport device downstream of said first location, and

(iii) bonding agent is sprayed onto said material within said pneumatic material transport device downstream of said air conducting installation, whereby said bonding agent is dispersed in air before it comes into contact with said material.

4,510,185

PROCESS FOR THE SURFACE MODIFICATION OF SYNTHETIC FIBERS

Antonio Chiolle; Alfio Vecchi, both of Ferrara, and Lino Credali, Casalecchio di Reno, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed Dec. 16, 1982, Ser. No. 450,268

Claims priority, application Italy, Dec. 18, 1981, 25665 A/81

Int. Cl.³ B05D *7/24*

U.S. Cl. 427—222 **6 Claims**

1. Process for obtaining water dispersible fibers of olefinic polymers, endowed with a high degree of cohesion, said process consisting in maintaining said fibers in contact with a stable emulsion formed by an aqueous solution of polyvinyl alcohol and a non-polar solvent in which the polyolefin is insoluble at the temperature at which said emulsion is used, under stirring in conditions of turbulence and at a temperature below the boiling temperature of the emulsion.

4,510,186

PROCESS FOR PREPARING A POROUS SHEET MATERIAL

Katsumi Kuriyama, Koshigaya; Isao Kondō, Ageo, and Iwao Misaizu, Kawaguchi, all of Japan, assignors to Dainichi Seika Color & Chemicals Mfg. Co., Ltd. and Ukima Colour & Chemicals Mfg. Co., Ltd., both of Tokyo, Japan

Filed Jul. 26, 1983, Ser. No. 517,437

Claims priority, application Japan, Apr. 3, 1982, 57-67239

Int. Cl.³ B05D *3/02*

U.S. Cl. 427—381 **7 Claims**

1. A process for preparing a porous sheet material, which comprises:

(1) impregnating and/or coating on a substrate a water-in-oil type polyurethane emulsion (d) comprising a hydrophobic polyurethane (a), a hydrophilic polyurethane (b), an organic solvent (c) and water; said process characterized in that said hydrophobic polyurethane (a) is a hydrophobic polyurethane dispersion (e) obtained by reacting a hydro-

phobic polyol, an organic diisocyanate and a chain extender in an organic solvent (c) which has a limited compatibility with water and in which the polyurethane thereby formed is substantially insoluble; said hydrophilic polyurethane (b) is a polyurethane containing about 20 to about 40% by weight, based on the total polymer, of polyoxyethylene groups; and the weight ratio of (a):(b) is about 90–99:about 10–1; and

(2) drying at a temperature of 60° to 100° C. for about 1 to 3 minutes and 100° to 150° C. for about 1 to 3 minutes.

4,510,187

METHOD FOR CONDITIONING PHONOGRAPH RECORDS

Irwin Rowe, 4605 S. Balfour, Las Vegas, Nev. 89121

Continuation of Ser. No. 407,774, Aug. 13, 1982, abandoned, which is a continuation-in-part of Ser. No. 265,188, May 18, 1981, abandoned. This application May 7, 1984, Ser. No. 607,586

Int. Cl.[3] **B05D** *1/28;* **D06M** *13/46*

U.S. Cl. 427—429 **6 Claims**

1. A method of conditioning the surface of a phonograph record which comprises applying thereto a film of a composition consisting essentially of dimethyl ditallow ammonium chloride.

2. The method of claim 1 wherein a solution of quaternary ammonium salt in a volatile solvent is applied to a soft, nonabrasive applicator, and the applicator is subsequently contacted with the record surface with relative movement therebetween.

4,510,188

TEXTILE MATERIAL OF A DARK FABRIC, LEATHER OR HIDE WITH LAYER OF MICROENCAPSULATED LIQUID CRYSTALS

Cinzia Ruggeri, Via Fratelli Gabba 7, 20100 Milano, Italy

Filed Mar. 4, 1983, Ser. No. 472,093

Claims priority, application Italy, Mar. 11, 1982, 20097 A/82

Int. Cl.[3] **C09K** *3/34*

U.S. Cl. 428—1 **20 Claims**

1. A textile material useful for articles of clothing, curtains, or coatings in which the chromatic effect is variable with environmental conditions to produce decorative effects, comprising a support consisting of a dark fabric, leather or hide having on at least one surface thereof a layer of a microencapsulated liquid cholesteric crystal composition including:

cholesteryl nonanoate: 73–80 parts by weight

oleyl cholesteryl carbonate: 5–12 parts by weight

cholesteryl chloride: 15 to 15.6 parts by weight; and

said crystal composition being adapted to change from a transparent state to a colored state within a given temperature range in response to environmental conditions.

4,510,189

CHRISTMAS TREE ORNAMENT

Leroy Girard, 2701 Holland St., Erie, Pa. 16504

Filed Aug. 30, 1982, Ser. No. 412,821

Int. Cl.[3] **B42D** *15/02;* **G09F** *1/06*

U.S. Cl. 428—19 **2 Claims**

1. In combination, a Christmas tree and ornaments,

said ornaments each comprising,

two sheets of relatively rigid material,

said sheet each having at least one straight side, integral hinging the said straight sides of said sheets together,

a round central opening in each of said rigid sheets,

a plurality of generally transparent sheets of material,

each said central opening having one of said transparent sheets overlying it,

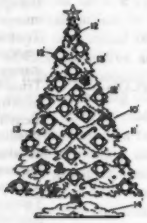
the central part of each said transparent sheet being generally convex and having a circular flange extending outwardly therefrom,

said central convex portion of each said transparent sheet overlying a said opening and said flange resting on the particular said rigid sheet around the particular opening,

and attaching means attaching said flanges to said rigid sheets,

pictures supported on said flanges,

and means on said ornament for attaching said ornament to said Christmas tree,



said means supporting said ornaments on said tree comprises holes in the sheets and supporting means in said holes for hanging said ornaments on said tree,

said rectangular sheets form a cubical shaped member with a top square insert.

4,510,190

TRANSPARENT, HEAT-INSULATING COATING FOR A TRANSPARENT SUBSTRATE

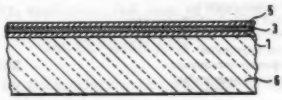
Hans J. Gläser, Beverungen, Fed. Rep. of Germany, assignor to Interpane Entwicklungs-und Beratungsgesellschaft mgH & Co. K.G., Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,258

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1982, 3211753

Int. Cl.[3] **E06B** *3/24;* **B32B** *15/00*

U.S. Cl. 428—34 **16 Claims**



1. A transparent, heat-insulating coating for a transparent substrate, the heat-insulating coating consisting essentially of a bismuth oxide-silver-bismuth oxide multilayer system wherein said bismuth oxide layers incorporate at least one substance which is more electronegative than bismuth or bismuth oxide.

4,510,191

CASTING NOZZLE

Toshiro Kagami, Kanagawa, and Kuniaki Watanabe, Tokyo, both of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

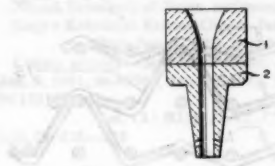
Filed Sep. 30, 1982, Ser. No. 429,014

Int. Cl.[3] **B22D** *0/1*

U.S. Cl. 428—36 **6 Claims**

1. A casting nozzle prepared by kneading a raw material consisting of 42 to 86% by weight of an alumina powder, 4 to 44% by weight of a graphite powder and 10 to 27% by weight of a fused silica powder after addition of a binder to said pow-

der components; pelletizing the resultant mixture; rubber pressing the resultant pellets and releasing a pressed casting



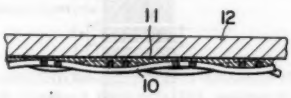
nozzle from said rubber press; and sintering the pressed casting nozzle at 800° to 1,100° C. after drying.

4,510,192

SYNTHETIC LEATHER FOR MOTORCARS HAVING A GROUND FABRIC KNITTED BY A PLURALITY OF STROKES

Setsuro Inoue, Ichikawa; Koichi Nikaido, and Makoto Nakagome, both of Tokyo, all of Japan, assignors to Yamato Chemical Industry Co. Ltd., Tokyo, Japan

Filed Oct. 21, 1983, Ser. No. 544,383
Claims priority, application Japan, Oct. 28, 1982, 57-163498
Int. Cl.³ B32B *7/00*
U.S. Cl. 428—151 **4 Claims**



1. A synthetic leather comprising a base fabric knitted by a plurality of strokes, a synthetic resin lagyer bonded to one side of the base fabric, and an adhesive layer bonding the base fabric to the resin layer.

4,510,193

FILTER SHEET MATERIAL

Hubert Blücher, Freytagstrasse 45; Hasso von Blücher, Sohnstrasse 58, both of D-4000 Düsseldorf, and Ernest de Ruiter, Höhenstrasse 57a, D-5090 Leverkusen 3, all of Fed. Rep. of Germany

Filed May 20, 1983, Ser. No. 496,742
Claims priority, application Fed. Rep. of Germany, Feb. 9, 1983, 3304349
Int. Cl.³ B32B *3/16, 27/14*
U.S. Cl. 428—196 **16 Claims**

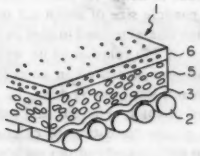
1. A filter sheet material comprising an air-permeable textile material, an adhesive uniformly covering about 20 to 80% of the surface of the textile, the applied adhesive having a height of about 0.05 to 0.5 mm and a diameter or width of about 0.1 to 5 mm, and about 10 to 250 g/m^2 of activated carbon adsorber particles anchored to the textile by the adhesive, the carbon particles having an internal surface of at least about 600 m^2/g and a diameter of at least about 0.1 mm.

4,510,194

HEAT-RETAINING MOISTURE-TRANSMISSIBLE WATER-RESISTANT FABRIC

Masao Miyake, Otsu, and Teruo Akita, Kusatsu, both of Japan, assignors to Asahi Kasei Textiles Ltd., Osaka, Japan

Filed Apr. 25, 1983, Ser. No. 487,949
Claims priority, application Japan, Apr. 28, 1982, 57-74365; Dec. 29, 1982, 57-233171; Jan. 14, 1983, 58-4722
Int. Cl.³ B32B *7/02, 3/26, 27/40*
U.S. Cl. 428—212 **18 Claims**



1. A heat-retaining moisture-transmissible water-resistant fabric comprising:

a fibrous substrate;

a microporous polymer layer (layer A) formed on at least one surface of the fibrous substrate;

a microporous polymer film layer (layer C) having a multiplicity of interconnecting fine pores communicating in all the directions in the interior of layer C, most of which have a size of at least 1 μm, said layer C being formed on said layer A, and

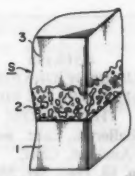
a polymer layer (layer D) containing 10 to 70% by weight; based on the polymer of layer D, of a heat ray-reflecting fine metal particles and having on the surface thereof fine pores having a size smaller than 0.5 μm and also having fine pores communicating with said fine surface pores, most of which have a size of not larger than 1 μm, said layer D being formed on said layer C.

4,510,195

FLEXIBLE INSULATIVE SUBSTRATES HAVING TWO GLASS LAYERS AT LEAST ONE SIDE THEREOF AND A METHOD FOR MAKING SUCH SUBSTRATES

Hideyo Iida; Koumei Kato; Toshio Mishuku, and Yukiko Fujimaki, all of Tokyo, Japan, assignors to Taiyo Yuden Kabushiki Kaisha, Taito, Japan

Filed Jul. 19, 1984, Ser. No. 632,559
Claims priority, application Japan, Mar. 7, 1984, 59-44554
Int. Cl.³ B32B *3/26, 15/04, 17/06*
U.S. Cl. 428—215 **10 Claims**



1. A flexible, glass-covered substrate comprising a thin metal plate, a first glass layer formed on at least one side of said metal plate and having a multitude of pores therein, and a second glass layer formed on said first glass layer.

4. The flexible, glass-covered substrate according to claim 1, wherein said metal plate has a thickness of from 10 to 300 μm, said first glass layer has a thickness of from 5 to 50 μm, and said second glass layer has a thickness of from 5 to 50 μm.

4,510,196

POLYCARBONATE COMPOSITIONS CONTAINING POWDERED SULFATES

Russell P. Carter, Jr., New Martinsville, W. Va., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Sep. 20, 1982, Ser. No. 423,928
Int. Cl.³ C08K 3/30; C08L 69/00
U.S. Cl. 428—220 14 Claims

1. A clear film having a thickness of less than 10 mils comprising

(i) an aromatic thermoplastic polycarbonate resin, and

(ii) between 0.025 to about 1.0 phr of sulfate powder having an average particle size of about 0.5 to about 15 microns said film being characterized in that its moisture content is not in excess of 2% relative to its weight and in that its light transmission measured in accordance with ASTM D-1003-61 is not less than 91.4%.

12. The film of claim 1, wherein said sulfate powder is selected from the group consisting of calcium sulfate, barium sulfate, strontium sulfate and radium sulfate.

4,510,197

WATER VAPOR PERMEABLE PRESSURE SENSITIVE ADHESIVES INCORPORATING MODIFIED ACRYLATE COPOLYMERS

Kishore R. Shah, Chelmsford, Mass., assignor to The Kendall Company, Boston, Mass.

Filed Apr. 1, 1983, Ser. No. 481,509
Int. Cl.³ B32B 00/00; C08F 226/10
U.S. Cl. 428—220 4 Claims

1. A water vapor permeable, pressure-sensitive adhesive composition comprising:

an adhesive copolymer having a molecular weight from about 200,000 to about 500,000, further comprising:

(a) from about 79 to 89 percent by weight of n-butyl acrylate;

(b) from about 10 to 20 percent by weight of a hydrophilic N-vinyl lactam, selected from the group consisting of 1-vinyl-2-pyrrolidone, 1-vinyl-5-methyl-2-pyrrolidone, 1-vinyl-2-piperidinone and 1-vinyl-ε-caprolactum; and

(c) from about 1 to 5 percent by weight of an acidic comonomer selected from the group consisting of acrylic acid, methacrylic acid, itaconic acid, and 2-sulfoethyl methacrylate; and

said adhesive copolymer in the form of a coating of about 1.0 mil thickness having water vapor transmission rates of greater than 1,000 gms/meter²/24 hours at 40° C. and 80 percent relative humidity; and further exhibiting a probe tack value of about 130 mg/cm², adhesion to steel of about 26.5 oz/inch width, and flat bar creep at 100° F. of about 4.5 hours.

4,510,198

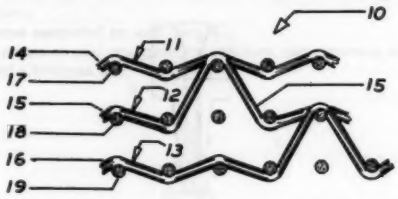
SHAPED STRUCTURES OF GRAPHITE FABRICS, AND THE LIKE, AND DEEP DRAWN MOLDED PRODUCTS THEREFROM

Walter A. Rheaume, Fullerton, Calif., assignor to Textile Products, Incorporated, Anaheim, Calif.

Filed Sep. 13, 1982, Ser. No. 417,123
Int. Cl.³ B32B 7/00
U.S. Cl. 428—246 9 Claims

5. A woven, continuous, multi-layered, molded fabric shape impregnated with a thermosetting resin, the fabric having upper and bottom layers interwoven with an inner layer, thereby comprising three moveable layers with respect to each other, the interweave between an inner layer and the upper and bottom layers being about 5% of the total weave in a layer;

the fabric being applied to a mold while moving the fabric layers with espect to each other to conform the fabric uniformly with respect to the mold and any irregularities



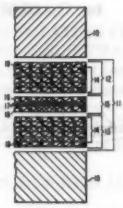
thereon, and continuing application of the fabric to the mold until the fabric has been built up to a final shape.

4,510,199

RELEASE SHEETS FOR LAMINATES WITH WAX AND ALGINATE SALT RELEASE LAYER

Lenon G. Brooker, Hampton, S.C., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1984, Ser. No. 599,899
Int. Cl.³ B32B 31/00
U.S. Cl. 428—248 10 Claims



1. A release sheet useful in laminating assemblies comprising:

(A) a thermosetting resin impregnated fibrous core layer, and

(B) a release coating on at least one side of the core layer, the release coating consisting essentially of a mixture of wax and alginate salt, where the solids weight ratio of (wax):(alginate salt) in the coating is from about (3 to 15):(1).

4,510,200

BULLET-PROOF PROTECTIVE SHIELDING AND GARMENTS AND METHODS OF MAKING THE SAME AND USE THEREOF

Joseph J. Samowich, 33 Greenwich Ave., New York, N.Y. 10014

Continuation-in-part of Ser. No. 356,656, Mar. 10, 1982, Pat. No. 4,409,275, which is a continuation-in-part of Ser. No. 537,445, Dec. 30, 1974, Pat. No. 4,329,386. This application Aug. 30, 1982, Ser. No. 412,696
Int. Cl.³ B32B 5/18
U.S. Cl. 428—252 29 Claims

1. A soft body armor protective shield or garment comprising a plurality of laminates superimposed one on the other, each laminate comprising a plastic surface film adhered to a layer of a cross-linked thermoset resilient emulsion adhered to a substrate of high force resistance fabric.

4,510,201
POLYVINYL CHLORIDE RESINOUS MOLDED SHEET PRODUCT

Tooru Takeuchi, Settsu; Masaru Nakamura, Hirakata, and Eiji Aoishi, Settsu, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jun. 7, 1982, Ser. No. 386,184

Claims priority, application Japan, Jun. 9, 1981, 56-88966; Jun. 9, 1981, 56-88967; Jun. 22, 1981, 56-97272; Aug. 24, 1981, 56-133171

Int. Cl.³ B32B *27/22, 27/30, 5/18*

U.S. Cl. 428—285 13 Claims

1. A polyvinyl chloride resionous molded sheet product comprising:

(a) a polyvinyl chloride resinous molded sheet obtained by dry-blending at a temperature between 50° C. and 100° C., 100 parts by weight of a polyvinyl chloride resin having an average particle size of not more than 50 microns, 50 to 100 parts by weight of an inorganic cellular filler and 40 to 100 parts by weight of a plasticizer, then molding said blend under heat and pressure to form a sheet;

(b) a layer laminated to one side of the sheet, said layer being selected from the group consisting of a glass fiber non-woven fabric, a synthetic fiber non-woven fabric and a victoria lawn; and

(c) a surface layer laminated to the other side of the sheet, said surface layer comprising a non-foamed synthetic resinous layer.

4,510,202
ADHESION ACTIVATED ARAMID FIBER

William R. Hatchard, Hockessin, Del., assignor to E. I. Du Pont De Nemours and Company, Wilmington, Del.

Filed Dec. 19, 1983, Ser. No. 563,226

Int. Cl.³ B32B *27/34*

U.S. Cl. 428—295 5 Claims

1. Adhesion activated yarn comprising aramid filaments coated with from about 1.0 to 5.0% by weight of a reaction product of an epoxide resin and an incompletely cured, thermosetting, aldehyde resin.

4,510,203
MAGNETIC RECORDING MEDIUM

Hiroshi Ogawa; Chiaki Mizuno, and Yasuo Tamai, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 3, 1983, Ser. No. 500,709

Claims priority, application Japan, Jun. 3, 1982, 57-95244

Int. Cl.³ G11B *5/70*

U.S. Cl. 428—425.9 13 Claims

1. A magnetic recording medium comprising a non-magnetic support having provided thereon a flexible magnetic layer comprising a ferromagnetic powder dispersed in a binder showing good dispersibility for the ferromagnetic powder, said binder comprising a copolymer of vinyl chloride-vinyl acetate-vinyl alcohol and a copolymer of ethylene-vinyl acetate which is graft-polymerized with vinyl chloride wherein said copolymer of vinyl chloride-vinyl acetate-vinyl alcohol is composed of 60 to 97 wt% of vinyl chloride up to 30 wt% of vinyl acetate and 3 to 15 wt% of vinyl alcohol and said copolymer of ethylene-vinyl acetate graft-polymerized with vinyl chloride is an ethylene-vinyl acetate copolymer composed of 90 to 30 wt% of ethylene and 10 to 70 wt% of vinyl acetate, which is further graft-polymerized with 20 to 90 wt% of vinyl chloride based on the ethylene-vinyl acetate copolymer.

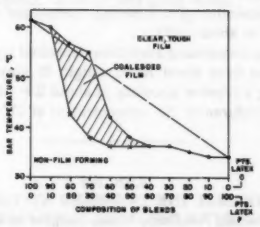
4,510,204
FILM-FORMING COMPOSITIONS OF NITRILE POLYMER LATEX BLENDS

June T. Duke, Chagrin Falls; Kenneth E. Samuels, Twin Lakes, and Mary-Catherine Brown, Bedford Heights, all of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Continuation-in-part of Ser. No. 434,134, Oct. 13, 1982, abandoned. This application Feb. 22, 1983, Ser. No. 468,181

Int. Cl.³ B05D *3/02;* B32B *15/08, 27/00*

U.S. Cl. 428—463 30 Claims



1. A film forming composition comprising a mixture of

(A) a first resin latex comprising

(i) a major proportion of an olefinically unsaturated nitrile monomer,

(ii) a minor amount of at least one other olefinically unsaturated monomer which is copolymerizable with the nitrile, and

(B) a second resin latex comprising

(i) about 20 to 60% of an olefinically unsaturated nitrile monomer, and

(ii) at least one other olefinically unsaturated monomer which is copolymerizable with the nitrile,

wherein the difference between the MFT of the first and second latexes is at least 10° C., and the weight ratio of the first latex to the second latex is from about 90/10 to 10/90.

26. A film forming composition comprising a mixture of

(A) a first resin latex comprising

(i) a major proportion of an olefinically unsaturated nitrile monomer,

(ii) a minor amount of at least one other olefinically unsaturated monomer which is copolymerizable with the nitrile, and

(B) A second resin latex comprising

(i) an olefinically unsaturated nitrile monomer, and

(ii) at least one other olefinically unsaturated monomer which is copolymerizable with the nitrile,

wherein the difference between the MFT of the first and second latexes is at least 10° C., and the weight ratio of the first latex to the second latex is from about 90/10 to 10/90, and the first or second latex or both latexes contain up to about 40 parts by weight on a solids basis, based on 100 parts on a solids basis the combination of the nitrile monomer and the other olefinic monomer in each latex, of a preformed homopolymer of a conjugated diene or a copolymer comprising a major proportion of a conjugated diene and a minor proportion of an olefinically unsaturated comonomer.

4,510,205

COPOLYESTERETHERS COATED WITH SARAN

Doyle A. Weemes, Greeneville, and Robert W. Seymour, Kingsport, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 26, 1983, Ser. No. 498,442
Int. Cl.³ B32B *27/30;* B05D *1/36;* B28B *3/20*
U.S. Cl. 428—483 12 Claims

1. A coated article comprising a substrate and a coating, said article having a decreased water vapor transmission rate and ability to withstand autoclaving conditions as evidenced by decreased tendency toward blistering, peeling and haze, said substrate comprising

copolyesterethers having an inherent viscosity of from about 0.8 to about 1.5 comprising

A. an acid component comprising at least one dicarboxylic acid selected from aliphatic dicarboxylic acids having 4–10 carbon atoms and phthalic acids, and

B. a glycol component comprising

(1) at least one glycol having 2–16 carbon atoms and

(2) from about 15 to about 50 weight percent, based on the weight of the polyesterether, of polytetramethyleneether glycol having a molecular weight of about 500 to about 1100,

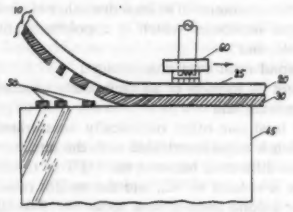
said coating comprising a solution-deposited layer of a copolymer derived from about 70–99 weight % vinylidene chloride and having a relative viscosity of about 0.8–1.8 as determined in tetrahydrofuran at 1% concentration at 25° C.

4,510,206

THERMAL INK TRANSFER RECORDING

Ralph J. Shuman, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Filed Aug. 22, 1983, Ser. No. 525,188
Int. Cl.³ B32B *9/04*
U.S. Cl. 428—488.1 19 Claims



1. In a thermal ink transfer laminate of the type comprising a heat transferable coating on a thermally conductive support member, said support member comprising material selected from the group consisting of paper and plastic film for transfer of images formed on said transferable coating at a temperature above the melt temperature of the coating by contact of a heated printing element to a side of the support opposite said coating, said support member essentially not electrically conductive, said formed images transferred to a receiving article in contact with the transferable coating, wherein the improved heat transferable coating is a hot melt comprising:

a wax binder comprising

a paraffin wax;

a resin binder; and

a coloring agent comprising

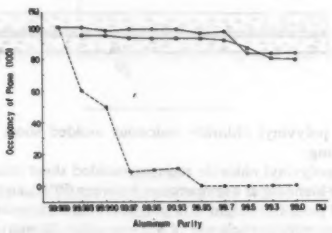
a dye dispersed in an unsaturated fatty acid having a carbon content between about C_{10} to C_{20}, said coloring agent effecting a sharp drop in the melt viscosity of the heat transferable coating to facilitate transfer of said formed images to the receiving article.

4,510,207

COMPOSITE ALUMINUM FOIL FOR USE AS ELECTRODE IN ELECTROLYTIC CAPACITOR

Masashi Mehada, Matsubara; Shozo Yoshimura, Osaka; Kenshiro Yamaguchi, Nara, and Osamu Iwao, Ashiya, all of Japan, assignors to Toyo Aluminium Kabushiki Kaisha, Osaka, Japan

Filed Sep. 30, 1983, Ser. No. 537,562
Claims priority, application Japan, Oct. 5, 1982, 57-174959; Mar. 15, 1983, 58-43811
Int. Cl.³ C22F *1/04*
U.S. Cl. 428—607 14 Claims



1. A composite aluminum foil for use as an electrode in an electrolyte capacitor, having an aluminum core layer of purity greater than 99.995% clad on each side with an aluminum outer layer of purity 99.0 to 99.99%, which has a rich proportion of a cubic texture.

4,510,208

DUPLEX METAL ALLOY/POLYMER COMPOSITIONS

Virgil B. Kurfman, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Jul. 1, 1983, Ser. No. 510,029
Int. Cl.³ B32B *5/00, 15/08;* C23C *13/02*
U.S. Cl. 428—624 16 Claims

1. A duplex metal/organic polymer multilayer composite structure, the structure comprising:

(a) at least one normally solid, formable thermoplastic polymer layer, said polymer layer having a forming temperature in degrees Kelvin, a first planar surface and a second planar surface, the first and second planar surfaces being generally parallel to each other;

(b) a first normally solid metal layer, the first metal layer being intimately adhered to at least one planar surface of the polymer layer, said first metal layer being formed from an alloy of two or more metals, said first metal layer having a thickness within the range of from 0.01 micrometers to 0.5 micrometers, the alloy melting at a temperature, or over a range of temperatures, that is within a temperature range of from about 85 to about 150 percent of the forming temperature of the thermoplastic polymer layer, said temperatures being in degrees Kelvin, and

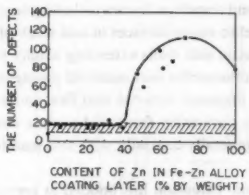
(c) a second normally solid metal layer, the second metal layer being intimately adhered to the first metal layer, said second metal layer being formed from a metal or an alloy of two or more metals that melts at a temperature, or over a range of temperatures, which is lower than that at which, or over which, melting of the metal alloy of the first metal layer occurs, said temperatures being in degrees Kelvin.

4,510,209

TWO LAYER-COATED STEEL MATERIALS AND PROCESS FOR PRODUCING THE SAME

Takashi Hada; Tatsuya Kanamaru, both of Tokai, and Yutaka Ogawa, Nagoya, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Sep. 9, 1981, Ser. No. 300,974
Claims priority, application Japan, Sep. 12, 1980, 55-126013
Int. Cl.³ B32B *15/01*
U.S. Cl. 428—659 6 Claims



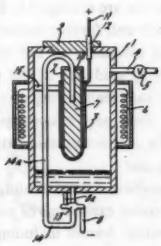
1. A two layer-coated steel material especially suitable for the cationic electrodeposition of a lacquer coating thereon which lacquer coating has few surface defects and excellent corrosion-resistant properties, said two-layer steel material comprising a steel substrate and a two layer-coating composed of (1) a base coating layer formed on a surface of said steel substrate, which base coating layer is zinc or a zinc-based alloy, said base coating capable of protecting the steel substrate from corrosion and (2) a surface coating layer formed on said base coating layer, which surface coating layer is an iron-zinc alloy having an effective amount of zinc up to 40% by weight sufficient to reduce the surface defects and enhance the corrosion resistance of said two layer coated material.

4,510,210

INTERNAL-INTEGRAL SODIUM RETURN LINE FOR SODIUM HEAT ENGINE

Thomas K. Hunt, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 25, 1984, Ser. No. 614,421
Int. Cl.³ H01M *6/36*
U.S. Cl. 429—11 6 Claims



1. In a thermoelectric generator adapted to convert heat energy from a heat source to electrical energy and which comprises:

(1) means for enclosing a first reaction zone;

(2) means for enclosing a second reaction zone;

(3) a reaction zone separator which:

(a) separates and substantially completes enclosure of said first reaction zone and said second reaction zone, and

(b) comprises a cationically conductive, solid electrolyte that is essentially impermeable to elemental alkali metal and compounds thereof and ionically conductive with respect to cations of said alkali metals;

(4) elemental alkali metal within said first reaction zone and in fluid communication with said solid electrolyte;

(5) an electrode within said second reaction zone in electrical contact with said solid electrolyte and sufficiently permeable to permit alkali metal to pass therethrough;

(6) means for conducting electron flow between the elemental alkali metal within the first reaction zone and the electrode;

(7) means for maintaining a temperature in said first reaction zone at least 100° C. in excess of the lowest temperature in said second reaction zone; and

(8) means for returning condensed elemental alkali metal from said second reaction zone to said first reaction zone, which means comprise a return line for said condensed alkali metal and a means for pumping said condensed alkali metal through said return line;

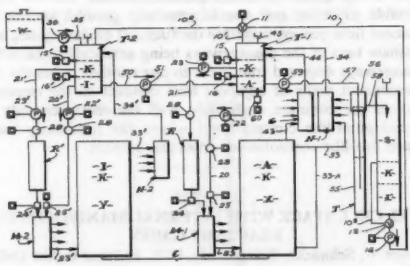
the improvement comprising that at least a portion of said return line is located within said second reaction zone, so that said portion of said return line receives sufficient heat from the heat source during operation of said generator to maintain said alkali metal within said portion of said return line at a temperature above the melting point of said alkali metal.

4,510,211

FUEL CELL ELECTROLYTE SUPPLY SYSTEM AND APPARATUS

Ralph C. Struthers, 39503 Calle El Fuente, Saugus, Calif. 91350

Filed Jun. 17, 1983, Ser. No. 505,305
Int. Cl.³ H01M *8/24*
U.S. Cl. 429—18 14 Claims

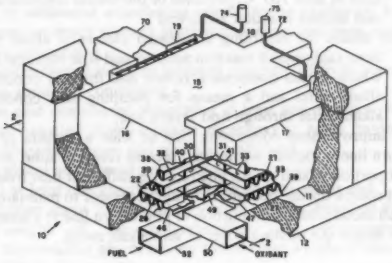


1. A fuel cell electrolyte control system and apparatus for a plurality of related fuel cells, each having an anode section filled with an aqueous anolyte solution and in which an anode electrode is immersed, an anolyte tank holding a supply of anolyte for the plurality of cells and a supply of hydrophobic liquid dielectric having a specific gravity which is less than the specific gravity of the anolyte, a liquid mixing supply manifold of dielectric material with anolyte and liquid dielectric inlets and an outlet for each cell, liquid delivery means moving anolyte and liquid dielectric from the anolyte tank to the anolyte and liquid dielectric inlets of said manifold, elongate tubular conductors of dielectric material connecting each outlet with a related cell and conducting commingled anolyte and liquid dielectric from the manifold to the cells; and liquid return means of dielectric material connected between and conducting the anolyte and liquid dielectric from the cells to the anolyte tank.

4,510,212
SOLID OXIDE FUEL CELL HAVING COMPOUND CROSS FLOW GAS PATTERNS

Anthony V. Fraioli, Hawthorn Woods, Ill., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Oct. 12, 1983, Ser. No. 541,176
Int. Cl.³ H01M 8/10
U.S. Cl. 429—30 20 Claims

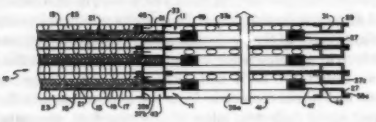


1. A fuel cell, comprising the combination of a core having a plurality of electrolyte and interconnect walls arranged to define a plurality of flow passageways, each electrolyte wall having cathode and anode materials sandwiching an electrolyte material, each interconnect wall having cathode and anode materials sandwiching an inert support material and many spaced small plugs of interconnect material extended therethrough which electrically connect the cathode and anode materials together, the walls being arranged whereby only anode material defines one set of the passageways suited for the fuel and whereby only cathode material defines another set of passageways suited for the oxidant, each interconnect wall being wavy and extended between adjacent pairs of generally parallel electrolyte walls and being proximate one another along spaced generally parallel line-like contact areas operable to define one tier of generally parallel alternately adjacent flow passageways for the fuel and oxidant gases, and alternate tiers of the passageways being arranged to have the passageways disposed transverse to one another, whereby the interconnect walls of adjacent tiers connect to the opposite sides of the common electrolyte wall therebetween only at spaced point-like contact areas where the previously mentioned line-like contact areas cross one another.

4,510,213
FUEL CELL STACK WITH INTERNAL MANIFOLDS FOR REACTANT GASES

Arthur W. Schnacke, Schenectady, N.Y., assignor to The Unites States of America as represented by the Department of Energy, Washington, D.C.

Filed Oct. 12, 1983, Ser. No. 541,185
Int. Cl.³ H01M 2/08
U.S. Cl. 429—36 13 Claims



1. Sealing means for preventing cross leakage of reactant gases between electrodes of opposite polarity in an electrolytic cell, said cell includes, in an axially aligned stack of components, first and second electrodes of opposite polarity, a porous medium for electrolyte separating said electrodes, a separator sheet in electrical communication with at least one electrode for the separation of an adjacent cell in a stack of cells, and first and second manifold passages for providing first and second reactant fluids to said first and second electrodes respectively, said sealing means comprising:

first and second transition frames in said stack of components supporting marginal surfaces of said porous electrolyte medium beyond the electrode edges and extending outwardly beyond said medium edges to said manifold passages, said transition frames including base walls generally parallel to major surfaces in said stack of components and perimetric side walls extending axially from the base walls to circumscribe said manifold passages,

sealing rings disposed between said first and second transition frames outwardly from said porous electrolyte medium and generally coaxially with said manifold passages, and

first and second extension lips bonded at proximal portions thereof to base walls of said transition frames at the marginal surfaces of said electrolyte medium and extending outwardly beyond said medium edges to sealingly fasten at distal portions thereof to said sealing rings whereby cross leakage of said first and second reactant fluids is minimized.

13. A fuel cell stack comprising a plurality of fuel cells arranged in a stack with major surfaces facing adjacent cells and a plurality of electrically conductive separator sheets disposed at least one each between adjacent cells, said sheets having projective means at major surfaces extending into electrical contact with adjacent electrodes to provide distribution space for reactant gases, said sheets further including outwardly extending margins at opposite sides of the stack beyond the fuel cell edges, said separator sheet margins provided with axial arrays of aligned openings circumscribing manifold passages for reactant gas,

each of said fuel cells including first and second electrodes of opposite polarity separated by a porous tile for containing electrolyte, said tile having marginal extentions outwardly along major surfaces beyond the edges of the electrodes, said electrodes and tile are arranged in a stack with major surfaces facing, each cell further including extension lips from the marginal extension of the tile surfaces and a sealing ring engaging said lips at the perimeter of said manifold passages, said sealing ring comprising in combination a tapered shoe and a correspondingly tapered wedge for sealingly connecting said extension lips at said manifold passages; and

first and second transition frames sealingly engaging and supporting the marginal extensions of said porous electrolyte tile, said transition frames including axial side walls extending to said separator sheet defining a plenum for gas distribution into said first and second electrodes respectively, said side walls including perimetric side walls circumscribing and defining said manifold passages in axial alignment with said arrays of opening in said separator sheets and internal side walls with apertures communicating with said gas space between electrodes and separator sheets, said perimetric side walls including apertures in communication with said manifold passages, whereby gas flow is permitted from the manifold passage to the gas distribution plenum to the gas space between electrodes and separator sheets.

4,510,214

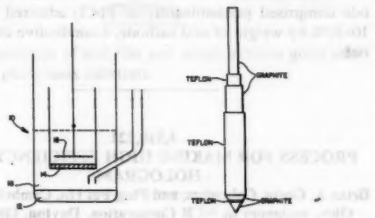
ELECTRODE WITH ELECTRON TRANSFER CATALYST

Dennis N. Crouse, Melrose; James C. Reynolds, Waltham, and Fraser M. Walsh, Arlington, all of Mass., assignors to Tracer Technologies, Inc., Newton, Mass.

Continuation-in-part of Ser. No. 193,818, Oct. 3, 1980, abandoned, which is a continuation of Ser. No. 060,929, Jul. 16, 1979, abandoned. This application Aug. 16, 1983, Ser. No. 523,419

Int. Cl.³ H01M *4/96*; B01J *31/12, 31/22*; C25B *11/12*

U.S. Cl. 429—43 3 Claims



1. In an electrochemical cell, the improvement comprising an electrode comprising an electroconductive carbon substrate, a ligand covalently bonded to said substrate, said ligand being selected from the group consisting of haloacyl and halomethyl, and an electron-transfer catalyst linked to said substrate by covalent bonding to said ligand, said electron-transfer catalyst serving to enhance electron transfer between said substrate and a molecule to be acted upon.

2. The electrode of claim 1 wherein said electron-transfer catalyst is a redox catalyst.

3. The electrode of claim 1 wherein said ligand is a bromoacyl group or a chloromethyl group.

4,510,215

CASING FOR A BATTERY OF CYLINDRICAL ELECTRIC CELLS

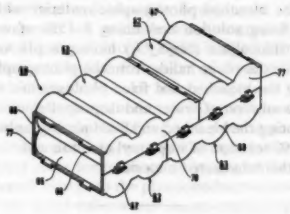
Michel Adam, Gournay, France, assignor to SAFT, Romainville, France

Filed Dec. 10, 1982, Ser. No. 448,628

Claims priority, application France, Jan. 14, 1982, 82 00528

Int. Cl.³ H07M *2/10*

U.S. Cl. 429—99 14 Claims



1. A casing for a battery of cylindrical electric cells lying parallel to one another, wherein the casing comprises interconnected first and second insulating half casings with each half casing comprising at least one module having n and one module having n+1 part cylindrical cell-receiving cavities extending parallel to one another between base plates which are orthogonal to the axes of said part cylindrical cavities, the end edges of the cavities being provided with respective first complementary interfitting portions to enable a plurality of modules to be connected end-to-end to increase the number of side-by-side cell-receiving cavities in a half casing, and the base plates being provided with respective second complementary interfitting portions to enable the first and second half casings of any one battery to be assembled with the cavities facing each other.

4,510,216

ELECTROCHEMICAL BATTERY INCLUDING A PRODUCT OF ACTIVATED CARBON FIBER AS AN ELECTRODE

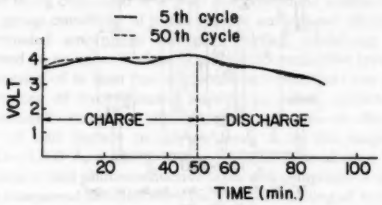
Takashi Nogami, Toyonaka, and Masayoshi Nawa, Wakayama, both of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Oct. 12, 1983, Ser. No. 541,024

Claims priority, application Japan, Feb. 8, 1983, 58-18160

Int. Cl.³ H01M *6/14*

U.S. Cl. 429—101 4 Claims



1. An electrochemical battery including electrodes immersed in a solution which contains an electrolyte dissolved therein and capable of producing an electromotive force by doping or undoping one of the electrodes, characterized in that a metal is used as one electrode and a product of activated carbon fiber having a specific surface area of 1,000 to 2,500 m^2/g is used as the other electrode.

4,510,217

SODIUM-SULFUR STORAGE BATTERY

Hiroshi Kagawa, and Kazumasa Matsui, both of Takatsuki, Japan, assignors to Yuasa Battery Co. Ltd., Osaka, Japan

Filed Sep. 8, 1983, Ser. No. 530,240

Claims priority, application Japan, Sep. 17, 1982, 57-162961

Int. Cl.³ H01M *4/36*

U.S. Cl. 429—104 3 Claims

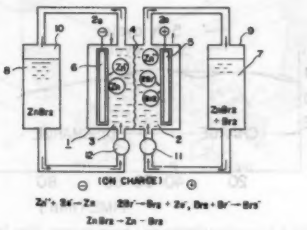
1. In a sodium-sulfur storage battery of the type utilizing an inside of a sodium-ion conductive solid electrolyte tube as a negative chamber and having an alpha-alumina ring jointed with solder glass to an upper open end of said solid electrolyte tube and an aluminum housing provided with a flange at its upper end and having a fine hole at its bottom incorporated in said solid electrolyte tube, the improvement comprising a negative auxiliary cover thermocompressively jointed through said flange of said aluminum housing to an upper surface of said alpha-alumina ring, a lower surface of said flange being jointed to an upper surface of said alpha-alumina ring and an upper surface of said flange being jointed to a lower surface of said negative auxiliary cover, and a negative cover provided with a negative current collector terminal welded to said negative auxiliary cover, wherein said aluminum housing is filled with sodium, except that an upper space between said solid electrolyte tube and said aluminum housing is under

vacuum or filled with sodium and an upper space inside said aluminum housing is filled with an inert gas.

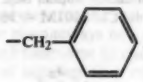
4,510,218
ELECTROLYTE FOR ZINC-BROMINE STORAGE BATTERIES

Yasuo Ando, and Toshihiko Ochiai, both of Tokyo, Japan, assignors to Kabushiki Kaisha Meidensha, Tokyo, Japan

Filed Nov. 1, 1983, Ser. No. 547,572
Claims priority, application Japan, Nov. 2, 1982, 57-191875
Int. Cl.³ H01M *4/58*
U.S. Cl. 429—198 **9 Claims**



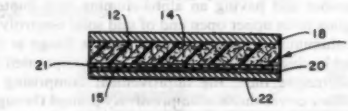
1. A negative electrolyte for an electrolyte circulation-type zinc-bromine storage battery comprising a mixture of an active material consisting of zinc bromide; a bromine complexing agent consisting of at least one of methyl ethyl morpholinium bromide and methyl ethyl pyrrolidinium bromide; a dendrite inhibitor including at least one compound selected from the group consisting of a quaternary ammonium salt of morpholine, pyridine, pyrrolidine and ammonia; and bivalent lead and tin ions, said ammonium salt having at least one ligand selected from the group consisting of $-CH_3$, $-C_4H_9$, $-C_{10}H_{21}$, $-C_{12}H_{25}$ and



4,510,219
BATTERY PLATE CONTAINING FILLER WITH CONDUCTIVE COATING

John J. Rowlette, Monrovia, Calif., assignor to California Institute of Technology, Pasadena, Calif.

Filed Nov. 14, 1983, Ser. No. 550,875
Int. Cl.³ H01M *4/60*
U.S. Cl. 429—212 **17 Claims**



1. A through-conductive plate for a lead-acid battery comprising:

a sheet of matrix resin containing a dispersion of particles containing a coating of conductive tin oxide that is insoluble in sulfuric acid electrolyte, has a high conductivity, and is thermodynamically stable during charge and discharge of said battery.

4,510,220
CELL WITH $PBCL_2$ CATHODE

Mysore L. Gopikanth; Han C. Kuo, both of Burlington, and Carl R. Schlaikjer, Winchester, all of Mass., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 30, 1983, Ser. No. 509,678
Int. Cl.³ H01M *4/56, 6/14*
U.S. Cl. 429—225 **12 Claims**

1. A non-aqueous, electrochemical cell comprising an anode comprised of an alkali or alkaline earth metal and an inorganic electrolyte comprised of SO_2 with an electrolyte salt dissolved therein, characterized in that said cell contains an active cathode comprised predominantly of $PbCl_2$ admixed with, from 10–30% by weight of said cathode, a conductive carbon material.

4;510,221
PROCESS FOR MAKING HIGH EFFICIENCY PHASE HOLOGRAMS

Brian A. Gorin, Columbus, and Ping-Pei Ho, Cambridge, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed Aug. 1, 1983, Ser. No. 519,442
Int. Cl.³ G03H *1/04*; G03C *5/44*
U.S. Cl. 430—1 **4 Claims**

1. A process for the production of a phase hologram comprising the steps of:

exposing silver halide photographic material in the exposure plane of a holographic optical system;

developing the exposed photographic material with a non-tanning developer;

treating the developed photographic material with a stopping agent consisting of a solution of 5–10% by weight of sodium sulfate (Na_2SO_4) and 2–3% by weight of acetic acid (CH_3COOH) having a pH value of from 2.8 to 3.2;

rinsing the developed photographic material with deionized water having a pH value of 7;

bleaching the developed photographic material with a tanning bleach solution having a range of pH values of from 2.2 to 2.7 and which includes 0.2% by weight of ammonium dichromate ($(NH_4)_2Cr_2O_7$) and 0.01–0.1% by weight of Potassium Bromide (KBr) which removes the silver of the metallic silver image areas while tanning the gelatin in the metallic silver image areas;

rinsing the developed photographic material with deionized water having a pH value of 7;

fixing the bleached photographic material with a non-tanning fixing solution containing 7–15% of weight of sodium thiosulfate ($Na_2S_2O_3$) having a pH value of 7 to remove the silver halide from the photographic material;

washing the bleached and fixed photographic material in a 50/50 solution of water and isopropyl alcohol;

dehydrating the bleached and fixed photographic material in a 100% solution of isopropyl alcohol; and

drying the dehydrated material.

4,510,222
PHOTOMASK WITH CORRECTED WHITE DEFECTS

Masaaki Okunaka, Fujisawa; Katsuro Mizukoshi, Yokohama; Mikio Hongo, Yokohama, and Tateoki Miyauchi, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 19, 1983, Ser. No. 496,245
Claims priority, application Japan, May 24, 1982, 57-86604
Int. Cl.³ G03F *9/00*
U.S. Cl. 430—5 **9 Claims**

1. A photomask with corrected white defects which comprises the white defects having been coated with a film comprising a mixture of silver and tantalum oxide to form a light-

shielding film for the white defects which is sufficiently resistant to chemicals such that the photomask can be washed

without dissolution of said film and which exhibits good adhesion to the photomask substrate.

4,510,223

MULTICOLOR ELECTROPHOTOGRAPHIC IMAGING PROCESS

Manfred R. Kuehnle, New London, N.H.; Ferdinand Martinez, Belmont, Mass.; I. V. Runyan, Bedford, Mass., and Carol M. F. Barry, Maynard, Mass., assignors to Coulter Systems Corporation, Bedford, Mass.

Continuation-in-part of Ser. No. 464,671, Feb. 7, 1983, abandoned. This application May 27, 1983, Ser. No. 498,825

Int. Cl.³ G03G *13/01*

U.S. Cl. 430—44 **6 Claims**

1. A process of electrophotographic multiple color imaging comprising forming superimposed plural toner images one at a time in sequential order in registry on the photoconductive surface of a uniform microcrystalline wholly inorganic photoconductive coating of an electrophotographic medium to form a composite of superimposed toner images and transferring said of toner images to an image receptor medium to form a superimposed color composite image pattern in registry, the individual toner images being formed successively one at a time from electrically deadenable liquid toner, the images being superimposed on said electrophotographic medium, electrically deadening each color toner image by drying same after formation and before formation of a successive image, exposing each of the dried color toner images and the nonimaged areas of the photoconductive surface to corona originated charged ions subsequent to drying said prior deposited toner image permitting said ions to pass through said electrically deadened dried color toner image or images to thereby apply a uniform overall charge to the photoconductive coating juxtaposed both the dried color toner image-containing areas and the nonimaged areas of the surface of the photoconductive coating, exposing the said charged surfaces to a second color pattern from a source thereof to form a latent charge image of the second color image pattern superimposed on the electrically deadened first toner image, applying a second color electrically deadenable liquid toner corresponding to the second color pattern to the second latent charge image to form a second color toner image superimposed on the first color toner image and repeating the steps of drying, charging, exposing, toning and drying until the desired color composite toner image is formed and transferring the thus produced composite of superimposed toner images to a receptor medium in a single transfer step.

4,510,224

ELECTROPHOTOGRAPHIC PHOTORECEPTORS HAVING AMORPHOUS SILICON PHOTOCONDUCTORS

Toshinori Yamazaki; Hiroyuki Nomori, both of Hachioji; Masatoshi Matsuzaki, Fussa; Tetsuo Shima, and Isao Myokan, both of Hachioji, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed May 3, 1983, Ser. No. 491,058

Claims priority, application Japan, May 6, 1982, 57-75658; Jun. 15, 1982, 57-102418

Int. Cl.³ G03G *5/082*

U.S. Cl. 430—57 **22 Claims**

1. A photoreceptor comprising a photoconductive layer having a thickness of at least 2500 Å, said photoconductive layer being composed of at least one compound selected from the group consisting of hydrogenated amorphous silicon and fluorinated amorphous silicon, a surface modifying layer formed on an upper surface of said photoconductive layer and composed of at least one compound selected from the group consisting of hydrogenated amorphous silicon carbide and fluorinated amorphous silicon carbide wherein the thickness "t" of said surface modifying layer is in the range 400 Å$\leqq$t$<$2,000 Å, a charge transport layer formed on a lower surface of said photoconductive layer and composed of at least one compound selected from the group consisting of hydrogenated amorphous silicon carbide and fluorinated amorphous silicon carbide, and an electrically conductive substrate.

4,510,225

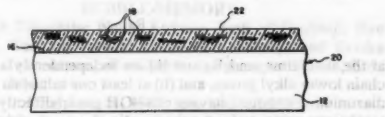
ELECTROPHOTOGRAPHIC METHOD FOR PRODUCING AN OPAQUE PRINT

Manfred R. Kuehnle, New London, N.H., and Ferdinand Martinez, Belmont, Mass., assignors to Coulter Systems Corporation, Bedford, Mass.

Filed Sep. 24, 1982, Ser. No. 423,021

Int. Cl.³ G03G *13/16, 13/24*

U.S. Cl. 430—126 **24 Claims**



1. A method of forming a print copy of an original image pattern comprising the steps of:

forming a dry toner image of the original image pattern electrophotographically on an electrophotographic medium,

providing an opaque substrate carrying a layer of light-transmissive thermoplastic polymer composition bonded to one surface thereof at an interface,

bringing the polymer layer and the toner image carrying surface into contact engagement,

simultaneously applying heat and pressure to the engaged surfaces, the heating being sufficient to bring the polymer layer to its softening temperature, thereby embedding and transparentizing the toner particles which define the toner image from the toner image carrier within the polymer layer entirely below the surface of said polymer layer and in the absence of relative lateral movement of said toner particles, maintaining the image density, resolution and integrity of the transferred image without loss to form a reflective print of the original image, and thereafter separating the engaged surfaces to recover said reflective print copy, whereby in viewing the reflective print, light passing through the light-transmissive polymer layer and the superimposed toner particles to the interface is reflected diffusingly back through the toner particles increasing the

intensity and furnishing brilliance and depth giving the viewer a pseudo three-dimensional image.

4,510,226

PHOTOSENSITIVE COMPOSITION AND PATTERN FORMING PROCESS USING SAME

Hajime Morishita; Motoo Akagi; Saburo Nonogaki, all of Tokyo; Nobuaki Hayashi, Saitama, and Sheichi Uchino, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,191

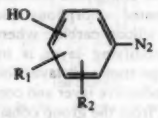
Claims priority, application Japan, Aug. 11, 1982, 57-138534

Int. Cl.³ G03C *1/58*

U.S. Cl. 430—144 **11 Claims**

1. A process for forming a pattern of a powder coating layer which comprises:

a step of coating a substrate with a photosensitive composition comprising (a) at least one salt of a diazonium compound of the formula:



(I)

wherein R_1 and R_2 are independently —H, —CH_3, —OCH_3 or

but R_1 and R_2 cannot be

at the same time; and R_3 and R_4 are independently a straight-chain lower alkyl group, and (b) at least one salt of an aromatic diazonium compound having no —OH group directly bonding to a benzene ring, to form a thin coating layer on said substrate, the amount of the diazonium compound salt (a) in said photosensitive composition being 1 to 60% by weight based on the total weight of the diazonium compound salts (a) and (b);

a step of imagewisely exposing said thin coating layer to light to make the exposed portions of the film sticky; and

a step of contacting phosphor powder particles with the exposed thin coating layer to adhere the powder particles to the exposed portions.

4,510,227

LIGHT-SENSITIVE AQUEOUS DEVELOPABLE COPYING MATERIAL AND PRODUCT BY COATING PROCESS THEREOF UTILIZING POLYSILOXANE AND ALKYLENE OXIDE COPOLYMER AS COATING AID

Dieter Mohr, and Kurt Riess, both of Wiesbaden, Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Continuation of Ser. No. 273,004, Jun. 12, 1981, abandoned. This application Aug. 15, 1983, Ser. No. 523,358

Claims priority, application Fed. Rep. of Germany, Jun. 14, 1980, 3022473

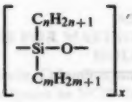
Int. Cl.³ G03C *1/60, 1/495, 1/68*; G03G *5/00*

U.S. Cl. 430—175 **10 Claims**

1. A light-sensitive copying material, comprising:

a support sheet; and

a dry light-sensitive layer which undergoes a change in solubility in an aqueous developer solution upon exposure to actinic light so that, when said layer is selectively exposed to a light image, selected areas of said layer can be dissolved in an aqueous developer solution and the remaining areas will resist dissolution in said aqueous developer solution to form a developed image corresponding to said light image, said light-sensitive layer comprising in admixture at least one light-sensitive component and from about 0.01 to about 10 percent by weight of a surface-active polysiloxane copolymer consisting essentially of dialkylsiloxane units and oxyalkylene units corresponding to the formulae



and $[-C_rH_{2r}-O-]_y$

in which

m and n are integers ranging from 1 to 4,

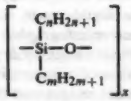
r is an integer ranging from 2 to 5,

x is an integer ranging from about 10 to 100 and

y is an integer ranging from 25 to 350, wherein said aqueous developer solution is comprised predominantly by weight of water.

9. A light-sensitive copying material produced by a process comprising the steps of

(1) coating a support sheet with a solution comprising in admixture of at least one light-sensitive component and from about 0.005 to about 1 percent of a surfactant dissolved in a single organic solvent to form a thin layer of the solution on the support sheet, said surfactant comprising a surface-active polysiloxane copolymer consisting essentially of dialkylsiloxane units and oxyalkylene units corresponding to the formulae



and $[-C_rH_{2r}-O-]_y$

in which

m and n are integers ranging from 1 to 4,

r is an integer ranging from 2 to 5,

x is an integer ranging from about 10 to 100 and

y is an integer ranging from about 25 to 350; and

(2) drying the thin layer to remove the solvent therefrom to produce a cloud-free, optically homogeneous light-sensitive layer of uniform coloration and layer thickness on the support sheet, wherein said light-sensitive layer undergoes a change in solubility in an aqueous developer solution upon exposure to actinic light so that, when said layer is selectively exposed to a light image, selected areas of said layer can be dissolved in an aqueous developer solution and the remaining areas will resist dissolution in said aqueous developer solution to form a developed image corresponding to said light image, and wherein said aqueous developer solution is comprised predominantly by weight of water.

4,510,228

LITHOGRAPHIC PRINTING PLATE WITH GELATIN LAYERS HAVING PH VALUES BELOW ISOELECTRIC POINT

Yasuo Tsubai; Yoshikazu Takaya, and Eiji Kanada, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Apr. 20, 1983, Ser. No. 486,837
Claims priority, application Japan, Apr. 22, 1982, 57-67763; May 13, 1982, 57-80784
Int. Cl.³ G03C 5/54, 1/30, 7/06
U.S. Cl. 430—204 13 Claims

1. A photosensitive element for the production of lithographic printing plates comprising a support, a physical development nuclei layer, and at least one gelatin-containing layer including a hardener and a silver halide emulsion layer disposed under said nuclei layer, which is adapted to the silver complex diffusion transfer process to utilize the transferred silver image on said nuclei layer as ink-receptive areas, all of the gelatin-containing layers having a pH value below the isoelectric point of the gelatin used in each layer.

12. A method for making a lithographic printing plate, which comprises imagewise exposing the photosensitive element according to claim 1 and developing the exposed element with a silver complex diffusion transfer developer.

4,510,229

LITHOGRAPHIC PHOTOSENSITIVE MATERIAL

Yutaka Oka; Naomi Saeki, and Yoshiharu Fuseya, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

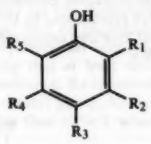
Continuation of Ser. No. 392,911, Jun. 28, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 591,227
Claims priority, application Japan, Jun. 26, 1981, 56-99194
Int. Cl.³ G03C 1/06, 5/24, 1/02
U.S. Cl. 430—265 19 Claims

1. A lithographic photosensitive material to provide high contrast half-tone dot or line silver images as final images for use in the graphic arts comprising:

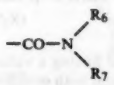
a support base;

a silver halide emulsion layer containing silver chlorobromide or silver chloroiodobromide, each containing up to 50 mol% silver bromide, and developed by a lithographic developer comprising a o- or p-dihydroxybenzene developing agent; and

a compound represented by the formula by the general formula (1):



wherein R_1 to R_5 may be the same or different, and each represents hydrogen, a halogen atom, an alkyl group, an alkoxy group, an aryl group,



wherein R_6 and R_7 each represents hydrogen or an alkyl group, or they may combine with each other to form a 5- or 6-membered nitrogen containing saturated hetero ring, —N-H—CO—R_8 or —$NHSO_2$—R_9 wherein R_8 and R_9 each represents an alkyl group, an aryl group or an aralkyl group, or R_3 and R_4, or R_4 and R_5 may combine with each other to form a benzene ring and that, it is necessary to said compound that one and only one of substituents R_1, R_3 and R_5 represents —$NHSO_2$—R_9, or the benzene ring formed by combining R_3 with R_4, or by combining R_4 with R_5 is substituted with at least one —$NHSO_2$—R_9 group.

4,510,230

PHOTOPOLYMERIZABLE COMPOSITIONS AND ELEMENTS CONTAINING ACID TO REDUCE SCUM AND STAIN FORMATION

Richard A. Coveleskie, Sayre, Pa., and Shung-Yan L. Lee, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 367,763, Apr. 12, 1982, abandoned. This application Aug. 15, 1983, Ser. No. 523,323
Int. Cl.³ G03C 1/94, 1/68
U.S. Cl. 430—273 10 Claims

1. An element comprising a copper substrate contacting a film of an aqueous processable photopolymerizable resist composition comprising a photopolymerizable ethylenically unsaturated monomer, a photoinitiator or photoinitiator system, a binder with an acid number greater than 100, and an acid having a molecular weight not greater than 300 with a solubility of at least 0.01 grams acid in 100 grams of water at 20° C. and a disassociating constant in the range from 1×10^{-5} to 5×10^{-2}, said acid present in an amount sufficient to inhibit stain or scum formation of said composition on a copper surface whereby the film has the property that after areawise exposure to a scanning mercury arc and development with 0.04N NaOH at 105° F., it is adherent in areas exposed to the mercury arc and nonadherent in areas not exposed to the mercury arc.

9. The element of claim 1 with a cover sheet in contact with the film.

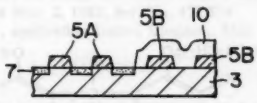
10. The element of claim 9 wherein the cover sheet comprises polyethylene or polyethylene terephthalate.

4,510,231

METHOD FOR MANUFACTURING A MAGNETIC BUBBLE MEMORY

Masatoshi Takeshita; Naoki Kodama, both of Hachioji; Ryo Suzuki, Kodaira; Teruaki Takeuchi, Kokubunji, and Yutaka Sugita, Tokorozawa, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jan. 31, 1983, Ser. No. 462,229
Claims priority, application Japan, Jan. 29, 1982, 57-11636
Int. Cl.³ B05D 5/00; H01F 10/06
U.S. Cl. 430—312 21 Claims



1. A method for manufacturing a magnetic bubble memory comprising the steps of:

(1) depositing a conducting film on a magnetic film capable of holding a magnetic bubble, said conducting film being suitable as a mask against ions to be implanted on said magnetic film;

(2) forming a photoresist pattern of a desired pattern on said conducting film;

(3) removing the exposed area of said conducting film form a pattern of conducting film and expose a patterned area of magnetic film;

(4) removing said photoresist pattern;

(5) covering a portin of the exposed patterned area of magnetic film and a portion of said pattern of conducting film adjacent said patterned area of magnetic film with a mask

film suitable against ions to be implanted in said magnetic film; and

(6) implanting ions into the uncovered patterned area of said magnetic film to form a magnetic bubble propagation pattern while using the uncovered conducting film pattern as a mask.

4,510,232

OPTICAL DATA STORAGE ELEMENT

Arthur M. Gerber, Belmont, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation of Ser. No. 454,069, Dec. 28, 1982, abandoned. This application Feb. 15, 1984, Ser. No. 580,430

Int. Cl.³ G03C 5/04

U.S. Cl. 430—494 4 Claims

1. A method for optically recording digitally encoded information which comprises exposing an element to focussed radiation, said element comprising an array of discrete regular geometric spaced depressions in a surface, each of said depressions carrying a mixture of zinc and sulfur, said mixture capable of transformation in response to a level of radiation adapted to effect said transformation, wherein said transformation is optically detectable substantially immediately after exposure to said radiation.

4,510,233

ANTISTATIC AGENT CONTAINING SILVER HALIDE PHOTOGRAPHIC LIGHT-SENSITIVE MATERIALS

Shigeki Yokoyama; Akira Hibino; Yukio Maekawa, and Hiroshi Kawasaki, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 27, 1983, Ser. No. 499,066

Claims priority, application Japan, May 28, 1982, 57-90909

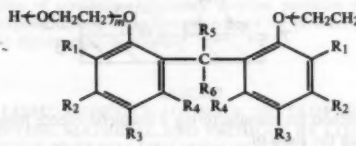
Int. Cl.³ G03C 1/84

U.S. Cl. 430—527 13 Claims

1. A silver halide photographic light-sensitive material, comprising:

a support base having thereon a silver halide emulsion layer; and

an antistatic layer which contains a nonionic surface active agent in an amount of 5–500 mg per m^2 having two polyoxyethylene chains in a molecule, the agent being represented by the formula (I):



(I)

wherein R_1 and R_3 each represents a substituted or non-substituted alkyl, aryl, alkoxy, aryloxy, acyl, amido, sulfonamido, carbamoyl or sulfamoyl group, or a halogen atom, R_2 and R_4 each represents a hydrogen atom, a substituted or nonsubstituted alkyl, aryl, alkoxy, aryloxy, acyl, amido, sulfonamido, carbamoyl or sulfamoyl group, or a halogen atom, R_5 and R_6 each represents a hydrogen atom, or a substituted or nonsubstituted alkyl or aryl group, wherein the sum total of carbon atoms in R_5 and R_6 is 2 or more, or R_5 and R_6 may form a ring by linking with each other, and m and n independently represent an average degree of polymerization of ethylene oxide which is 2 to 40.

4,510,234

SILVER HALIDE PHOTOGRAPHIC EMULSION

Syoji Matsuzaka, Hino; Makoto Kajiwara; Masanobu Miyoshi, both of Odawara, and Kiyoshi Yamashita, Hino, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

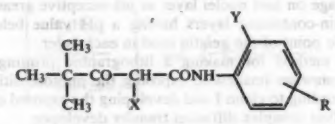
Filed Sep. 7, 1983, Ser. No. 530,024

Claims priority, application Japan, Sep. 10, 1982, 57/158463

Int. Cl.³ G03C 1/02

U.S. Cl. 430—557 14 Claims

1. A silver halide photographic emulsion, which comprises (i) a mono-dispersed silver halide emulsion comprising 3 to 50 mole % of silver chloride, 1 mole % or less of silver iodide and 50 to 97 mole % of silver bromide having a grain size distribution of 0.15 or less in terms of the coefficient of variation $S/\bar{r}$ (where S is standard deviation and $\bar{r}$ is mean grain diameter), and (ii) a coupler represented by the following formula:



wherein X represents an organic group which is bonded through an oxygen atom, a nitrogen atom or a sulfur atom to the coupler and is eliminable during the coupling reaction with an oxidized product of a color developing agent; Y represents a halogen atom, an alkoxy group, an aryloxy group, a diacylamino group or an alkyl group; R represents a trifluoromethyl group, an acylamino group, a sulfonamide group, a ureido group, an alkyl group, an alkoxy group, an aryloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group or an imide group, which is bonded to the anilide group at the 4- or 5-position.

4,510,235

SILVER HALIDE PHOTOGRAPHIC EMULSIONS

Toshinao Ukai; Masaki Okazaki; Haruo Takei; Ichizo Toya, and Sadanobu Syuto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

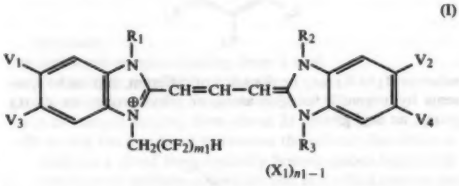
Filed Apr. 26, 1984, Ser. No. 604,184

Claims priority, application Japan, Apr. 28, 1983, 58-75401; Nov. 28, 1983, 58-223874

Int. Cl.³ G03C 1/02

U.S. Cl. 430—574 21 Claims

1. A silver halide photographic emulsion containing in combination at least one dye represented by the following formulae (I) and (II) and at least one dye represented by the following formulae (III) and (IV):



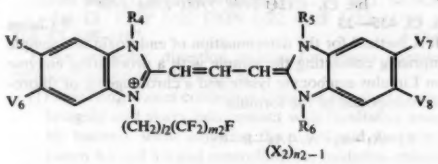
(I)

$(X_1)_{n1-1}$

wherein m_1 is an integer having a value of 1 to 8, R_1, R_2 and R_3, which may be identical with or different from one another, independently represent a $-CH_2(CF_2)_{l1}H$ group or a substituted or unsubstituted alkyl group, providing that at least one of R_1, R_2 and R_3 possesses an acid substituent (such as, for example, a sulfonic acid group or carboxylic acid group), l_1, which may be equal to or not equal to m_1, is an integer having a value of 1 to 8, V_1, V_2, V_3 and V_4, which may be identical with or different from one another, independently represent a hydrogen atom, a halogen atom, a substituted alkyl group, an

unsubstituted alkyl group, an alkoxy group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a cyano group, or a trifluoromethyl group, X_1 represents an anion, and n_1 is 1 or 2, providing that n_1 where the dye forms an intramolecular salt;

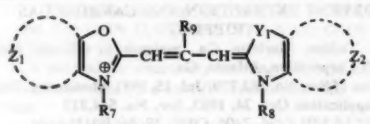
(II)



$(X_2)_{n2-1}$

wherein l_2 is 0 or an integer having a value of 1 to 8, m_2 is 0 or an integer having a value of 1 to 8, providing that the total value of l_2 and m_2 is an integer greater than 0, R_4, R_5, and R_6, which may be identical with or different from one another, independently represent a $-(CH_2)_j(CF_2)_kF$ group or a substituted or unsubstituted alkyl group, providing that at least one of R_4, R_5 and R_6 represents an alkyl group containing an acid substituent (such as, for example, a sulfonic acid group or carboxylic acid group), j is 0 or an integer having a value of 1 to 8, k is 0 or an integer having a value of 1 to 8, providing that the total value of j and k is an integer greater than 0, V_5, V_6, V_7 and V_8, which may be identical with or different from one another, independently represent a hydrogen atom, a halogen atom, a substituted alkyl group, an unsubstituted alkyl group, an alkoxy group, an acyl group, an acyloxy group, an alkoxycarbonyl group, a carbamoyl group, a sulfamoyl group, a cyano group or a trifluoromethyl group, X_2 represents an anion, and n_2 is 1 or 2, providing that n_2 is 1 where the dye forms an intramolecular salt;

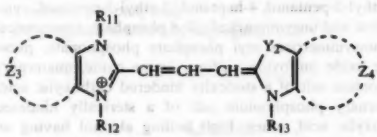
(III)



$(X_3)_{n3-1}$

wherein Y_1 represents an oxygen atom, a sulfur atom, a selenium atom, or N—R_{10}, Z_1 and Z_2, which may be identical with or different from each other, independently represent an atomic group necessary for the formation of an unsubstituted or substituted benzene ring or naphthalene ring, R_7, R_8 and R_{10} independently represent an unsubstituted or substituted alkyl group, providing that at least one of R_7, R_8 and R_{10} possesses an acid substituent, R_9 represents a hydrogen atom, an alkyl group, or an aralkyl group, X_3 represents an anion, and n_3 is 1 or 2, **providing than** n_3 is 1 where the dye forms an intramolecular salt;

(IV)



$(X_4)_{n4-1}$

wherein Y_2 represents a sulfur atom, a selenium atom, or N—R_{14}, Z_3 and Z_4, which may be identical with or different from each other, independently represent an atomic group necessary for the formation of a unsubstituted or substituted benzene ring or naphthalene ring, R_{11}, R_{12}, R_{13} and R_{14} independently represent an unsubstituted or substituted alkyl group, providing that at least one of R_{11}, R_{12}, R_{13} and R_{14} possesses an acid substituent, X_4 represents an anion, and n_4 is 1 or 2, providing that n_4 is 1 where the dye forms an intramolecular salt.

4,510,236

THERMALLY GENERATED TONING AGENT SYSTEM FOR PHOTOTHERMOGRAPHIC IMAGING COMPOSITIONS

Gustav Gutman, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 20, 1983, Ser. No. 563,687

Int. Cl.³ G03C *1/00*

U.S. Cl. 430—619 **15 Claims**

1. A heat-developable light-sensitive article having on a support at least one layer comprising

(a) at least one light-sensitive silver halide or light-sensitive silver-halide forming component;

(b) at least one organic silver salt;

(c) at least one reducing agent for silver ion;

(d) 2-(hydroxymethyl)-1(2H)-phthalazinone as a toning agent precursor, and

(e) in a catalytically effective amount, an aromatic polycarboxylic acid or derivative thereof, an aromatic polycarboxylic anhydride or derivative thereof, or an heterocyclic polycarboxylic acid or derivative thereof as a catalyst for said toning agent precursor.

4,510,237

IN SITU FILM HARDENING WITH ALDEHYDE BISULFITE AND NONHARDENING ALDEHYDE

Reginald A. Booker, New Castle, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 11, 1983, Ser. No. 540,776

Int. Cl.³ G03C *1/30*

U.S. Cl. 430—621 **5 Claims**

1. A process of forming a hardened photographic film in wich a layer comprised of silver halide dispersed in gelatin is coated on a support in contact with another layer and dried, characterized in that an aldehyde hardening agent is formed in situ by reacting an aldehyde bisulfite in one layer and a non-hardening aldehyde in an adjacent layer.

4,510,238

PHOTOGRAPHIC MATERIAL AND A PROCESS FOR ITS MANUFACTURE

Samuel B. Kingston, Doddinghurst, and Graham Evans, Galleywood, both of England, assignors to Ciba Geigy AG, Basel, Switzerland and Ciba Geigy AG, Basle, Switzerland

Filed Mar. 2, 1983, Ser. No. 471,556

Claims priority, application United Kingdom, Mar. 11, 1982, 8207063

Int. Cl.³ G03C *1/72*

U.S. Cl. 430—627 **15 Claims**

1. Photographic material which comprises on a support at least one aqueous gelatino silver halide emulsion layer, the binder of which essentially consists of gelatin and of from 20 to 60% by weight of the binder material of the final dried silver halide emulsion layer of a polymer latex containing particles of a particle size of less than 0.05 microns, the polymer latex being obtained by emulsion polymerising of

(a) a monomer selected from the group consisting of an alkyl acrylate or an alkyl methacrylate or

(b) a monomer mixture essentially consisting of both an alkyl acrylate and an alkyl methacrylate or

(c) a monomer mixture essentially consisting of an alkyl acrylate and/or an alkyl methacrylate together with up to 5% by weight of an ethylenically unsaturated copolymerisable acid and/or up to 30% by weight of other ethylenically unsaturated comonomers

in the presence of at least 12% by weight of the monomers present of an anionic surfactant selected from the group con-

sisting of a sulphosuccinate or a sulphated or sulphonated polyethylene oxide compound at a temperature of from 15° to 90° C. by use of a redox initiator system which is present to the extent of from 0.1 to 3% by weight of the monomers present.

4,510,239

DOUBLE ANTIBODY IMMUNOASSAYS OF ENZYMES SUCH AS PROSTATIC ACID PHOSPHATASE

Steven P. Miller, Los Altos, and Stella S. M. Quan, Belmont, both of Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 9, 1982, Ser. No. 406,644
Int. Cl.³ G01N *33/54*
U.S. Cl. 435—7 38 Claims

1. A method for assaying an enzyme in a sample comprising:

(a) contacting said sample with a first antibody (Ab_1) against said enzyme, wherein the amount of Ab_1 employed is at least sufficient to bind substantially all of said enzyme in said sample;

(b) incubating a first medium containing said Ab_1 and said enzyme for a time at least sufficient to enable said Ab_1 to bind to substantially all of said enzyme to form Ab_1~enzyme complexes;

(c) contacting said Ab_1~enzyme complex with a second antibody (Ab_2) capable of recognizing Ab_1, wherein the amount of Ab_2 employed is at least sufficient to bind substantially all of said Ab_1~enzyme complexes and form a precipitate with substantially all of said complexes;

(d) incubating a second medium containing said Ab_2 and said Ab_1~enzyme complexes for a time at least sufficient to enable (i) said Ab_2 to bind to substantially all of said Ab_1~enzyme complexes to form Ab_2~Ab_1~enzyme complexes and (ii) substantially all of said Ab_1~Ab_2~enzyme complexes to precipitate out of said second medium;

(e) separating said precipitated Ab_2-Ab_1-enzyme complexes from said second medium;

(f) contacting said separated, precipitated Ab_2~Ab_1~enzyme complexes with a solution (i) having a pH at least sufficient to solubilize substantially all of said Ab_2~Ab_1~enzyme complexes and (ii) comprising γ-globulin in an amount at least sufficient to prevent substantially any precipitation of Ab_2~Ab_1~enzyme complexes at a pH suitable for formation of said precipitate, thereby forming a resulting solution;

(g) contacting a sufficient amount of said resulting solution with a reaction medium, to thereby form a reaction environment containing various constituents, wherein said reaction medium is capable of being used to assay said enzyme; and

(h) assaying said enzyme.

4,510,240

HOMOGENEOUS ENZYME IMMUNOASSAY WITH HEATING STEP AFTER INCUBATION, THERESIA

Jürgen Schrenk, Wilzhofen, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim-Waldhof, Fed. Rep. of Germany

Filed Aug. 18, 1982, Ser. No. 409,278
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1981, 3134361
Int. Cl.³ G01N *33/54*
U.S. Cl. 435—7 6 Claims

1. In a method for the determination of an antigen or hapten in a homogeneous aqueous phase by incubation of a test sample in the presence of antigen- or hapten-specific antibodies and of a defined amount of enzyme-marked antigen or hapten in a reaction solution and measurement of the activity of the marker enzyme, the improvement consisting of heating the reaction solution, after incubation, at temperature conditions and for a time sufficient to inactivate the marker enzyme by at least 50% in the absence of the antigen- or hapten-specific antibody and measuring the enzyme activity thereafter.

4,510,241

PEPTIDE-TYPE SUBSTRATES USEFUL IN THE QUANTITATIVE DETERMINATION OF ENDOTOXIN

Donald F. Mills, University City, Mo., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Division of Ser. No. 298,994, Sep. 3, 1981, Pat. No. 4,406,832. This application Jun. 24, 1983, Ser. No. 507,596
Int. Cl.³ C12Q *1/38, 1/00, 1/04, 1/06*
U.S. Cl. 435—23 9 Claims

1. A method for the determination of endotoxin in a sample comprising contacting the sample with a proclotting enzyme from Limulus amebocyte lysate and a chromogenic or fluorogenic compound of the formula:

$$R_1—A_1—A_2—A_3—A_4—B—R_2$$

wherein R_1 represents hydrogen, a blocking aromatic hydrocarbon or acyl; A_1 represents an L or D-amino acid selected from Ileu, Val or Leu; A_2 represents Glu or Asp; A_3 represents Ala or Cyst; A_4 represents Arg; B represents a linkage group selected form ester and amide linkage groups; and R_2 represents a chromogenic or fluorogenic group which is covalently attached to the C-carboxyl terminal of arginine through the B linkage group, the fluorogenic or chromogenic moiety being capable of being enzymatically cleaved from the remainder of the peptide-type compound in the presence of endotoxin and pro-clotting enzyme to form at least part of a marker compound, and detecting the presence or absence of the marker compound in the sample.

4,510,242

PROCESS FOR PRODUCING FUEL GRADE ALCOHOL BY SOLVENT EXTRACTION AND CARRIER GAS STRIPPING

Daniel W. Tedder, Marietta, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Continuation of Ser. No. 283,739, Jul. 15, 1981, abandoned. This application Oct. 24, 1983, Ser. No. 544,813
Int. Cl.³ C12P *7/04, 7/06;* C07C *29/86;* B01D *1/14*
U.S. Cl. 435—157 11 Claims

1. A method of preparing alcohol, comprising:

fermenting a fermentable biomass feedstock in a fermentation unit at a temperature of between about 25° C. and about 95° C., thereby forming an aqueous fermentation liquor containing alcohol;

extracting said aqueous fermentation liquor with an organic hydrophobic solvent containing an extractant for said alcohol at a temperature of between about 25° C. and about 95° C., thereby forming an alcohol-organic solvent extract phase and an aqueous raffinate, said extractant being dissolved in said organic solvent and being selected from the group consisting of isodecanol, 2-ethylhexanol, 2-methyl-2-pentanol, 4-heptanol, 3-ethyl-3-pentanol, symmetrical and unsymmetrical alkyl phosphate, symmetrical and unsymmetrical aryl phosphate phosphonate, phosphine oxide, sulfoxide, sulfone, amine oxide, quaternary ammonium salt of a sterically hindered carboxylic acid; quaternary phosphonium salt of a sterically hindered carboxylic acid, ether, high boiling alcohol having an alkyl group of at least ten carbon atoms, and mixtures thereof;

removing said alcohol-organic solvent extract phase from said aqueous raffinate;

contacting said alcohol-organic solvent extract phase with a carrier gas thereby separating said alcohol from said alcohol solvent extract phase and forming an alcohol laden carrier gas vapor; and

separating said alcohol from said carrier gas.

4,510,243

ANAEROBIC DIGESTION PROCESS OF WASTES CONTAINING CELLULOSE

Ryoichi Haga; Masahiko Ishida, and Yoji Odawara, all of Hitachi, Japan, assignors to The Agency of Industrial Science and Technology, Tokyo, Japan

Filed Oct. 14, 1982, Ser. No. 434,321
Claims priority, application Japan, Oct. 14, 1981, 56-162628
Int. Cl.[3] C12P 5/02; C12N 1/22; C02F 3/30, 11/04
U.S. Cl. 435—167 4 Claims

1. An anaerobic digestion process for wastes containing cellulose comprising the steps of:

(1) liquefying wastes containing cellulose in a slurry state by bringing said slurry into contact with facultative anaerobic bacteria, while adjusting the pH of said slurry to between 6.5 and 8.0 and controlling the oxidation-reduction potential of said slurry between −50 mV and −300 mV while supplying oxygen to said slurry,

(2) converting the slurry obtained in the first step (1) into methane and carbon dioxide by bringing said slurry into contact with obligatory anaerobic bacteria without supplying oxygen to said slurry, and

(3) separating the digested slurry obtained in the second step (2) into separate water and digested sludge.

4,510,244

CELL LABELING WITH ANTIGEN-COUPLED MICROSPHERES

David R. Parks, Stanford; Virginia M. Bryan, San Carlos, and Leonard A. Herzenberg, Stanford, all of Calif., assignors to The Board of Trustees of the Leland Stanford Jr. University, Stanford, Calif.

Continuation of Ser. No. 141,031, Apr. 17, 1980, abandoned. This application Sep. 22, 1982, Ser. No. 421,668
Int. Cl.[3] C12N 15/00, 5/00; C12P 21/00; G01N 33/54
U.S. Cl. 435—172.2 5 Claims

1. A method for selectively isolating a hybridoma cell producing antibodies to a specific determinant site which comprises:

combining a heterogeneous mixture of hybridoma cells producing a variety of antibodies including an antibody for said determinant site with said determinant site bound fluorescent labeled microspheres, wherein said label permits mechanical selection of cells labeled with said microspheres as compared to cells which are unlabeled;

centrifuging said mixture of hybridoma cells and microspheres to provide a monolayer of sedimented cells, followed by separating bound microspheres from unbound microspheres;

selectively segregating by means of said microsphere label from cells having fewer microspheres than said predetermined number individual cells labeled with said microspheres at a predetermined minimum number of microspheres per cell; and

growing said selectively segregated cell.

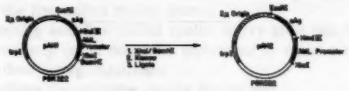
4,510,245

ADENOVIRUS PROMOTER SYSTEM

Lawrence S. Cousens; Graeme I. Bell, and Pablo D. T. Valenzuela, all of San Francisco, Calif., assignors to Chiron Corporation, Emeryville, Calif.

Filed Nov. 18, 1982, Ser. No. 442,687
Int. Cl.[3] C12N 15/00, 1/20, 1/16, 1/18, 1/00; C12P 21/00, 21/02, 19/34; C07H 21/04
U.S. Cl. 435—172.3 6 Claims

1. A yeast expression vector comprising a replication origin functional in yeast and a DNA coding segment and an adenovirus major late promoter segment adjacent to the 5′ end of the



coding segment, the promoter segment being oriented so as to initiate transcription of the coding segment.

4,510,246

ISOLATION OF CYCLASE, EPIMERASE AND A RING EXPANSION ENZYME FOR PRODUCING UNNATURAL CEPHALOSPORINS

Saul Wolfe, Kingston; Donald Westlake, and Susan Jensen, both of Edmonton, all of Canada, assignors to Queen's University at Kingston, Kingston, Canada

Filed Aug. 23, 1982, Ser. No. 410,302
Int. Cl.[3] C12N 9/00, 9/06; C12P 35/00, 35/06
U.S. Cl. 435—183 3 Claims

1. A process for isolating cyclase, epimerase and a ring expansion enzyme from a cell-free extract of a prokaryotic beta-lactam producing organism comprising:

(a) precipitating contaminating proteins from said cell-free extract by addition of ammonium sulfate to 40% saturation;

(b) separating precipitated protein from a supernatant;

(c) adding ammonium sulfate to 70% saturation to said supernatant thereby precipitating desired enzymes;

(d) suspending said precipitated desired enzymes in pH 7 buffer;

(e) separating the epimerase by gel filtration chromatography; and

(f) separating the cyclase and ring expansion enzymes from each other by ion exchange chromatography.

4,510,247

USE OF GLUCOSE OXIME TO INCREASE GLUCOSE ISOMERASE ACTIVITY IN BACTERIAL CELLS

Beth E. Whitted, and George Boguslawski, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkhart, Ind.

Filed Feb. 9, 1983, Ser. No. 465,243
Int. Cl.[3] C12N 9/92, 9/38; C12R 1/19, 1/20
U.S. Cl. 435—207 3 Claims

1. A method of increasing the production of enzymes involved in carbohydrate metabolism by a bacterium capable of producing such enzyme which bacterium is selected from the species of *Flavobacterium arborescens* or *Escherichia coli* which method comprises growing the bacterium in an aqueous nutrient medium containing glucose oxime, but employing a carbon source other than glucose, wherein the concentration of glucose oxime is sufficient to cause an increase in the production of the enzyme.

4,510,248

PROCESS FOR CONCENTRATING AND PURIFYING HUMAN URINARY KALLIKREIN

Koichiro Nakanishi, Ashiya, and Hajime Hiratani, Sennan, both of Japan, assignors to Japan Chemical Research Co., Ltd., Kobe, Japan

Filed Jun. 29, 1983, Ser. No. 509,030
Claims priority, application Japan, Jun. 30, 1982, 57-113364
Int. Cl.[3] C12N 9/64, 9/48, 9/50
U.S. Cl. 435—226 7 Claims

1. In the concentration and purification of human urine kallikrein, a process which comprises contacting chitosan with human urine at a pH from 4.0 to 7.0 to adsorb kallikrein in the urine on the chitosan, filtering off the chitosan from the urine

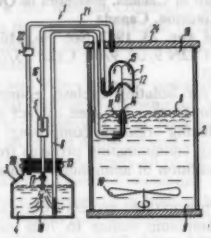
and eluting kallikrein from the chitosan with an aqueous alkaline solution.

4,510,249

APPARATUS FOR CHEMICAL FROTH SUPPRESSION IN A FERMENTER

Jury V. Redikultsev, Puschino, mikroraion "G", 19, kv. 113, and Leonid A. Litvinenko, Puschino, mikroraion "AB", 8, kv. 74, both of Moskovskaya oblast, U.S.S.R.

Filed Dec. 21, 1982, Ser. No. 451,755
Claims priority, application U.S.S.R., Dec. 22, 1981, 3364403
Int. Cl.³ C12M *1/36*
U.S. Cl. 435—289 **1 Claim**



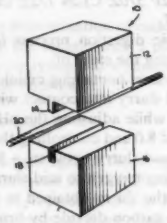
1. An apparatus for chemical froth suppression comprising:
a fermenter;
a vessel containing a chemical froth suppressor;
a pressure pipe connecting said vessel with said fermenter;
a first nozzle having an outlet opening and disposed in said fermenter, said nozzle being positioned on said pressure pipe at a preselected level of said froth so as to form a jet of froth suppressor which escapes through said outlet opening;
a chamber accommodated inside said fermenter above the level of said froth and having an inlet port coaxial with said outlet opening of said nozzle for said jet of froth suppressor escaping from said outlet opening to enter said inlet port, said chamber having an outlet, and a concave wall opposite to said inlet port for reflecting said jet of froth suppressor which enters said chamber through said inlet port thereof to said outlet;
a discharge pipe connecting the outlet of said chamber with said vessel containing said chemical froth suppressor to withdraw said jet of froth suppressor reflected from said concave wall and convey it to said vessel;
a pneumatic pump disposed in said discharge pipe to suck said chemical froth suppressor from said chamber;
a second nozzle secured on said discharge pipe in said vessel containing said chemical froth suppressor to form a jet of said chemical froth suppressor flowing along said discharge pipe into said vessel containing said chemical froth suppressor;
a third pipe communicating a gas zone of said fermenter overlying said froth with a gas zone of said vessel containing said chemical froth suppressor overlying the level of said chemical froth suppressor; and
a throttle means disposed in said third pipe and serving to maintain a predetermined pressure in said vessel containing said chemical froth suppressor during circulation therethrough by said pneumatic pump of said chemical froth suppressor to maintain thereby a required pressure in said pressure pipe.

4,510,250

METHOD OF HAIR DAMAGE ASSESSMENT

Bernard L. Kabacoff, Norwalk, Conn., and Alok K. Govil, Marlboro, N.J., assignors to Revlon, Inc., New York, N.Y.

Filed Sep. 2, 1983, Ser. No. 528,919
Int. Cl.³ G01N *33/00*
U.S. Cl. 436—63 **9 Claims**



1. A method of measuring hair damage based on copper reaction with active negative sites on hair comprising the steps of:
(a) placing a known amount of hair into a sealed vial containing a water solution of a known amount of copper sulfate having Cu^{++} ions that is stabilized with the complexing agent ethanolamine and buffered with sodium tetraborate, said solution having a pH of about 9.0 to 9.5;
(b) reacting said solution with said hair by heating the vial; and
(c) determining the copper uptake by the hair.

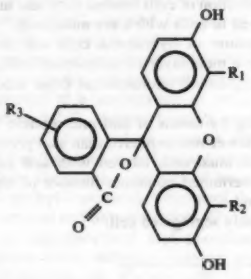
4,510,251

FLUORESCENT POLARIZATION ASSAY FOR LIGANDS USING AMINOMETHYLFLUORESCEIN DERIVATIVES AS TRACERS

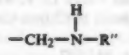
Curtis L. Kirkemo, Grunee, and Mohammed T. Shipchandler, Libertyville, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Nov. 8, 1982, Ser. No. 440,043
Int. Cl.³ G01N *33/54, 33/58, 33/52, 33/74*
U.S. Cl. 436—536 **5 Claims**

1. A method for determining ligands in a sample comprising intermixing with said sample a tracer of the formula:



wherein
R_1 is a



group wherein R" is a ligand-analog having at least one common epitope with a ligand so as to be specifically recognizable by a common antibody;
R_2 is hydrogen or a group represented by R_1; and

R_3 is hydrogen, amino or carboxyl; and biologically acceptable salts thereof; and an antibody capable of specifically recognizing said ligand and said tracer; and then determining the amount of tracer bound to antibody by fluorescence polarization techniques as a measure of the amount of ligand in the sample.

4,510,252
EASILY FORMED CHEMICALLY RESISTANT GLASS FIBERS

Russell M. Potter, Granville, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Nov. 18, 1983, Ser. No. 553,283
Int. Cl.³ C03C *13/00, 3/08*
U.S. Cl. 501—35 **4 Claims**

3. A devitrification resistant, sulfuric acid resistant and water resistant glass fiber consisting essentially of in approximate weight percent 67% to 70% SiO_2, 3% to 4% Al_2O_3, 10% to 13% CaO, 2% to 3% MgO, 7% to 10% of (Na_2O+K_2O), 3 to 6% B_2O_3, and less than 1% of each of Fe_2O_3, TiO_2 and F_2, said glass fiber having a delta T of at least about 395° F. and a durability (% fiber weight loss at 96° C.) in water for 24 hours of less than about 1.6% and in 10% H_2SO_4 for 24 hours of less than about 1.1%, said glass having a viscosity, in poise, of 10 to the 2.5 power at a temperature of about 2350° F. to about 2500° F.

4,510,253
ALUMINUM RESISTANT CERAMIC FIBER COMPOSITION

Frank T. Felice, Norristown, and Celeste B. Yonushonis, Paoli, both of Pa., assignors to Combustion Engineering, Inc., Windsor, Conn.

Filed May 26, 1983, Ser. No. 498,379
Int. Cl.³ C04B *35/80*
U.S. Cl. 501—95 **10 Claims**

1. A lightweight, porous ceramic fiber composition resistant to wetting and attack by molten aluminum alloys comprising:
(a) from 20 to 65 weight % alumina silica ceramic fiber;
(b) an additive containing essentially crystalline $9Al_2O_3.2B_2O_3$ such that the ceramic fiber composition contains from 1 to 12 weight % $9Al_2O_3.2B_2O_3$; and
(c) the remainder comprising a refractory binder in a quantity at least sufficient to bind said ceramic fiber composition together.

4,510,254
METHOD OF TREATING ZEOLITE ORES TO REMOVE DISCOLORING IMPURITIES AND IMPROVE ITS BRIGHTNESS AND RESULTING FINELY GROUND ZEOLITE

Horton H. Morris, 1715 Waverland Dr., Macon, Ga. 31204; John R. Whyte, Jr., 1737 Graham Rd., Macon, Ga. 31211; Ellen Forbus, 96 Hardie St., Gordon, Ga. 31031; Catherine M. Dentan, 343 Orange St., Macon, Ga. 31201, and David R. Collins, Rte. 1, Box 54, Irwinton, Ga. 31042

Filed Jan. 23, 1984, Ser. No. 573,208
Int. Cl.³ C04B *33/02*
U.S. Cl. 501—146 **41 Claims**

1. A method of treating zeolite ores to remove therefrom discoloring impurities and improve the brightness characteristics thereof, said method comprising the steps of:
(a) mixing a pulverized zeolite ore with a dispersant and water to disperse said zeolite and form an aqueous zeolite slurry;
(b) degritting said aqueous zeolite slurry to remove grit having a particle size of 44 μm or more;
(c) removing fines having a particle size of at least 50% less than 2 μm or less and containing discoloring impurities from said degritted zeolite slurry;
(d) subjecting a mixture of the zeolite slurry after fines removal step (c) and a fine grinding media to rapid agitation to effect a fine milling of said zeolite to a particle size of at least 20% less than 2 μm and removing said grinding media from said fine milled zeolite slurry;
(e) removing fines having a particle size of at least 40% less than 2 μm or less and containing discoloring impurities from the fine milled zeolite slurry;
(f) subjecting said fine milled zeolite slurry after said fines removal step (e) to magnetic separation to remove magnetic discoloring impurities;
(g) bleaching the resulting zeolite slurry; and
(h) recovering the zeolite in dry form from the resulting slurry.

4,510,255
PROCESS FOR MANUFACTURING A SUPPORTED CATALYST FOR THE HYDROTREATMENT OF HYDROCARBON OILS

Hervé Toulhoat, Le Pecq; Jean-Claude Plumail, Le Vesinet; Marc Mercier, Ales, and Yves Jacquin, Sevres, all of France, assignors to Ste Francaise des Products pour Catalyse Pro-Catalyse chez Institut Francais du Petrole, Rueil-Malmaison, France

Filed Oct. 21, 1983, Ser. No. 544,148
Claims priority, application France, Oct. 21, 1982, 82 17769
Int. Cl.³ B01J *21/04, 35/08*
U.S. Cl. 502—10 **8 Claims**

1. In a process for manufacturing a catalyst comprising at least one carrier material whose base element is alumina, silica or silica-alumina and at least one active element selected from the metals of groups V, VI and VIII or compounds thereof, in which process the active elements are incorporated on the carrier and the resultant catalyst is dried and thermally activated, the improvement wherein, before or after introducing the active elements, the carrier is shaped into balls, said balls are calcined at about 300° to 1000° C. and then coarsely crushed and the resultant particles whose average size represents 0.2 to 0.8 time the average diameter of the balls are recovered, the process being followed, when the active elements or a portion thereof are not already present, with the introduction of said elements.

4,510,256
ZEOLITE SSZ-19

Stacey I. Zones, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed May 13, 1983, Ser. No. 494,244
Int. Cl.³ C01B *33/26;* **B01J** *29/28*
U.S. Cl. 502—62 **10 Claims**

1. A composition of matter comprising a crystalline solid having a mole ratio of an oxide selected from silicon oxide, germanium oxide and mixtures thereof to an oxide selected from aluminum oxide, gallium oxide, and mixtures thereof greater than about 6:1, and having the X-ray diffraction lines of Table 1.

9. A method for preparing the composition of claim 1, comprising:
(a) preparing an aqueous mixture containing sources of an organonitrogen compound, an oxide selected from aluminum oxide, gallium oxide, and mixtures thereof, and an oxide selected from silicon oxide, germanium oxide, and mixtures thereof, the aqueous mixture having the following composition in terms of mole ratio of oxides:

YO_2/W_2O_3	>6
R_2O/W_2O_3	0.5–40

wherein R is an organonitrogen cation selected from the group consisting of cyclopentyltrimethylammonium cations, 2,2-dimethylpropyl trimethylammonium cations, ethyl-1-azoniabicyclo [2.2.2.] octane cations, 1-azoniaspiro [4.4] nonane cations, or mixtures thereof, Y is silicon,

germanium or mixtures thereof, W is aluminum, gallium or mixtures thereof, wherein said aqueous mixture has a mole ratio of OH^-/YO_2 of 0.95 to 1:1 and

(b) maintaining the mixture at a temperature of at least 100° C. until crystals of said composition form.

4,510,257

SILICA-CLAY COMPLEXES

Robert M. Lewis, Sugarland, Tex.; Kevin C. Ott, Chatsworth, Calif., and Rutger A. Van Santen, Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 8, 1983, Ser. No. 559,545

Int. Cl.³ B01J *21/16*

U.S. Cl. 502—63 **16 Claims**

1. A clay composition comprising silica pillars intercalated between the layers of an expandable, swelling layer, lattice clay mineral or synthetic analogue thereof wherein said silica pillars comprise at least two silicon atom layers.

7. A process for preparing a clay composition comprising clay having silica pillars intercalated between the interlayers of said clay wherein said silicon pillars comprise at least two silicon atom layers, which process comprises contacting a smectite type clay with a solution of a polyhedral oligosilsesquioxane of the following general formula $(ZSiO_{1.5})_n(OSiZ_2)_m$, where n and m are zero or integers and n+m does not equal zero and Z is an organic moiety containing an atom(s) possessing cationic and/or coordinating characteristics with the proviso that all of the Z's on a particular oligosilsesquioxane need not be the same.

11. A hydrocarbon conversion catalyst comprising the silica intercalated clay product of claim 1 admixed with a matrix material.

14. A hydrocarbon conversion catalyst, comprising the silica intercalated clay of claim 1 functionalized with a cation selected from the group consisting of hydrogen, ammonium, Group IB to VIII of the Periodic Table and mixtures thereof.

4,510,258

CATALYSTS CONTAINING MIXED OXIDES OF VANADIUM AND PHOSPHORUS

George D. Sucio, Ridgewood, N.J.; Giancarlo Stefani, and Carlo Fumagalli, both of Bergamo, Italy, assignors to The Lummus Company, Bloomfield, N.J.; Alusisse Italia S.p.A., Milan, Italy

Filed Aug. 17, 1983, Ser. No. 523,931

Int. Cl.³ B01J *27/14;* **C07D** *307/60*

U.S. Cl. 502—209 **21 Claims**

1. A catalyst, comprising:

mixed oxides of vanadium and phosphorus, said catalyst having a phosphorus to vanadium ratio of from 1:1 to 2:1, said catalyst having been pretreated by contacting a dried catalyst precursor comprising mixed oxides of vanadium and phosphorus, in finely divided form, with an acid solution and drying of the acid treated particles to produce a dried catalyst.

4,510,259

CATALYSTS FOR THE PRODUCTION OF MALEIC ANHYDRIDE BY THE OXIDATION OF BUTANE

Carl A. Udovich, Joliet, and Robert C. Edwards, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation-in-part of Ser. No. 382,180, May 26, 1982, Pat. No. 4,416,802. This application Aug. 25, 1983, Ser. No. 526,167

The portion of the term of this patent subsequent to Nov. 22, 2000, has been disclaimed.

Int. Cl.³ B01J *27/14, 31/12*

U.S. Cl. 502—209 **35 Claims**

1. A process for the manufacture of a phosphorus-vanadium catalyst suitable for use in the manufacture of maleic anhydride, which process comprises reacting in an aqueous medium a vanadium compound and inorganic acid, then adding orthophosphoric acid to form a soluble vanadium-phosphorus catalyst, removing the acidified water, and adding an aliphatic alcohol having about 1 to about 8 carbon atoms, and either an aromatic acid, or an aromatic anhydride, or a mixture of these, removing the alcohol, and removing the aromatic acid and aromatic anhydride, and drying the catalyst syrup under vacuum of about 0 to about 300 mm Hg at a temperature of about 90° to about 150° C. to produce the solid catalyst.

4,510,260

SELF-PROMOTED MOLYBDENUM AND TUNGSTEN SULFIDE HYDROTREATING CATALYSTS FROM BIS(TETRATHIOMETALLATE) PRECURSORS

Edward I. Stiefel, Bridgewater; Wie-Hin Pan, Fanwood, and Russell R. Chianelli, Somerville, all of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jul. 29, 1983, Ser. No. 518,363

Int. Cl.³ B01J *27/02, 31/12*

U.S. Cl. 502—219 **15 Claims**

1. A self-promoted catalyst formed by heating one or more carbon-containing, bis(tetrathiometallate) catalyst precursor salts selected from the group consisting of $(NR_4)_2[M(WS_4)_2]$, $(NR_4)_x[M(MoS_4)_2]$ and mixtures thereof, in a non-oxidizing atmosphere in the presence of sulfur and hydrogen at elevated temperature for a time sufficient to form said catalyst, wherein (NR_4) is a carbon-containing, substituted ammonium cation and R is selected from the group consisting of (a) alkyl group, aryl group and mixture thereof and (b) mixtures of (a) with hydrogen, wherein promoter metal M is covalently bound in the anion and is Ni, Co or Fe and wherein x is 2 if M is Ni and x is i3 if M is Co or Fe.

4,510,261

CATALYST WITH HIGH GEOMETRIC SURFACE AREA

Carmo J. Pereira, Columbia; Louis Hegedus, Rockville, and James M. Maselli, Columbia, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,346

Int. Cl.³ B01J *21/04, 23/10, 23/40, 35/04*

U.S. Cl. 502—304 **13 Claims**

1. A catalyst suitable for auto emission control comprising a solid, transitional alumina extrudate support structure having a cylindrical, hollow annular configuration with internal reinforcing vanes, a nitrogen surface area of at least 50 m^2/g; a diameter of up to about 6.5 mm; an aspect ratio of the length to the diameter of from about 1 to 5; a geometric surface area of at least 25% greater than a hollow tube of the same inside and outside diameter; a porosity of at least 0.3 cm^3/g; a surface area per reactor volume of at least 5 cm^2/cm^3 and a catalytically-effective amount of one or more platinum group metals deposited directly on the support structure without having any washcoat present.

4,510,262

DOUBLY PROMOTED CATALYST WITH HIGH GEOMETRIC SURFACE AREA

Gwan Kim, Olney; Carmo J. Pereira, Columbia; Louis Hegedus, Rockville, and James M. Maselli, Columbia, all of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,440

Int. Cl.³ B01J *21/04, 23/10, 23/58, 35/04*

U.S. Cl. 502—304 **13 Claims**

1. A catalyst suitable for auto emission control comprising a solid, transitional alumina extrudate support structure having a cylindrical, hollow annular configuration with internal reinforcing vanes, a nitrogen surface area of at least 50 m^2/g; a diameter of up to about 6.5 mm; an aspect ratio of the length to the diameter of from about 1 to 5; a geometric surface area of at least 25% greater than a hollow tube of the same inside and outside diameter; a porosity of at least 0.3 cm^3/g; a surface area per reactor volume of at least 5 cm^2/cm^3 and deposited directly on the support structure without having any washcoat present from about 1–10 wt. % ceria, an alkali metal promoter

expressed as the wt. % of the oxide M_2O in an effective amount up to about 5% and a catalytically-effective amount of one or more platinum group metals.

4,510,263

CATALYST WITH HIGH GEOMETRIC SURFACE AREA ALUMINA EXTRUDATE AND CATALYST WITH HIGH GEOMETRIC SURFACE AREA

Carmo J. Pereira, Columbia, and Louis Hegedus, Rockville, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Oct. 17, 1983, Ser. No. 542,363

Int. Cl.³ B01J *21/04, 23/85, 35/00*

U.S. Cl. 502—314 **19 Claims**

1. A transitional alumina extrudate having a cylindrical hollow annular configuration with internal reinforcing vanes, a nitrogen surface area of at least 50 m^2/g; a diameter of up to about 6.5 mm; and aspect ratio of the length to the diameter of from about 0.5 to 5; a geometric surface area of at least 25% greater than a hollow tube of the same inside and outside diameter; a porosity of at least 0.3 cm^3/g; and a surface area per reactor volume of at least 5 cm^2/cm^3.

4,510,264

PROCESS FOR THE PREPARATION OF A CATALYST FOR THE SYNTHESIS OF METHANE

Hiroo Matsuoka; Seiichi Matsuoka; Tsunekichi Yamabe; Hirokazu Fujie; Kenji Mori; Kouji Tamura; Masatoshi Yamada, and Akio Furuta, all of Handa, Japan, assignors to JGC Corporation, Otemachi, Japan

Filed Aug. 31, 1983, Ser. No. 528,107

Claims priority, application Japan, Oct. 1, 1982, 57-173085; Mar. 16, 1983, 58-42235; Apr. 22, 1983, 58-70085

Int. Cl.³ B01J *23/74*

U.S. Cl. 502—328 **1 Claim**

1. A process for preparing a catalyst for the synthesis of methane by the hydrogenation of carbon monoxide and/or carbon dioxide, comprising adding a barium salt solution to alumina, pyrolyzing the barium salt to obtain barium oxide carried on alumina and then adding a nickel salt solution to said barium oxide carried on alumina, pyrolyzing the nickel salt to obtain nickel oxide carried thereon, the amount of barium oxide so carried being in the range of 0.27–8.06 wt. % of the alumina as barium, the amount of nickel oxide so carried being in the range of 0.05–30 wt. % as nickel of the total of the alumina and nickel.

4,510,265

PLATINUM/SILVER VANADATE CATALYZED DIESEL EXHAUST PARTICULATE FILTER

Michael M. Hartwig, Chatham, N.J., assignor to Engelhard Corporation, Iselin, N.J.

Filed May 4, 1984, Ser. No. 607,048

Int. Cl.³ B01J *23/64, 23/68*

U.S. Cl. 502—330 **6 Claims**

1. A diesel exhaust particulate filter comprising a high temperature resistant filter element having porous walls adapted to filter particulates present in the exhaust gases of diesel engines and collect the particulates from the gases flowed through the element on the surfaces of the porous walls, the surfaces of the walls having been first provided with a catalyst comprised of a mixture of a platinum group metal and silver vanadate, which catalyst mixture lowers the temperature at which the collected particulates are ignited and combustion thereof initiated, whereby the particulates are continuously removed by burning at the temperature of the exhaust gases with relatively high efficiency and low pressure drop.

4,510,266

STEPPING MOTOR CONTROLLER

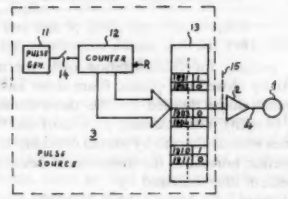
Bastiaan B. B. Eertink, Grubbenvorst, Netherlands, assignor to Océ-Nederland B.V., Venlo, Netherlands

Filed Oct. 4, 1982, Ser. No. 432,631

Claims priority, application Netherlands, Oct. 8, 1981, 8104590

Int. Cl.³ H02K *29/04*

U.S. Cl. 318—696 **15 Claims**



1. Apparatus for generating signal pulses for controlling a stepping motor, comprising:

a pulse generator effective for producing a substantially constant frequency pulse signal;

a memory having a multiplicity of successively addressable memory locations, each of said memory locations having a content;

addressing means responsive to said pulse signal for successively addressing said memory locations;

said memory comprising output means responsive to the respective contents of said memory locations as they are addressed successively by said addressing means for producing electrical signals having frequencies to control said stepping motor; and

said contents being arranged to produce in response to said addressing at least one of an increase in the frequency of said electrical signals for starting of said stepping motor and a decrease in said frequency thereof for stopping of said stepping motor.

4,510,267

PREPARATION OF OLEFINS FROM SYNTHESIS GAS USING RUTHENIUM SUPPORTED ON CERIC OXIDE

Ronald Pierantozzi, Macungie, Pa., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation of Ser. No. 373,934, May 3, 1982, abandoned. This application Mar. 5, 1984, Ser. No. 573,433

Int. Cl.³ C07C *1/04*

U.S. Cl. 518—715 **10 Claims**

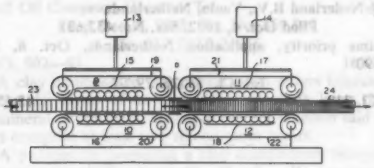
1. In a process for the synthesis of hydrocarbons by reacting hydrogen and carbon monoxide over a ruthenium-containing catalyst, the method for selectively synthesizing olefins which comprises reacting the hydrogen and carbon monoxide under reaction conditions over a ruthenium catalyst made by preparing a solution of a ruthenium carbonyl compound in a solvent sufficient to wet the surface of a ceric oxide-containing support selected from the grouup consisting of CeO_2, Al_2O_3-CeO_2, SiO_2-CeO_2, CeO_2-carbon or CeO_2-other rare earth oxides, contacting the ceric oxide-containing support with the ruthenium carbonyl compound-containing solution and removing the solvent to yield the ruthenium carbonyl compound deposited on the ceric oxide-containing support.

4,510,268

DIRECTIONAL FLEXIBILIZATION OF EXPANDED THERMOPLASTIC FOAM SHEET FOR LOW TEMPERATURE INSULATION

Hiroshi Tonokawa, Suzuka, Japan, and Masao Nakamura, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 9, 1982, Ser. No. 367,183
Int. Cl.³ B29D *27/00*
U.S. Cl. 521—146 **12 Claims**



1. A process for flexibilization of a thermoplastic rigid, substantially closed-cell plastic foam sheet having a generally rectangular shape defined by the three-dimensional coordinates X (length), Y (thickness), Z (width) and the YZ, XZ and XY planes normal thereto by partial crushing of the foam sheet in a direction normal to the direction of desired flexibility, the improvement characterized by

A. selecting a freshly expanded foam sheet having (1) a bulk density of 20 to 100 kg/m^3, (2) an anisotropic cell structure oriented in the $\bar{Y}$-axial direction with an average $\bar{y}$ cell size of 0.05 to 1.00 mm, (3) $\bar{Y}$-axial compressive strength of at least 1.8 kg/cm^2, and (4) the sheet having a thickness of from about 10 to about 300 millimeters;

B. compressing said foam sheet within 0.25 to 240 hours of expansion in a short confined compression zone having a maximum length of 300 millimeters for a period of at least one second to form a directionally flexibilized foam; and thereafter

C. recovering of a directionally flexibilized foam having

(1) anisotropically wrinkled cell wall structure with wrinkles in the direction of flexibilization;

(2) average cell sizes $\bar{x}$, $\bar{y}$ and $\bar{z}$ measured in the axial directions $\bar{X}$, $\bar{Y}$ and $\bar{Z}$ satisfying the following conditions:

$\bar{y}$=0.05–1.0 mm, and

$\bar{y}/\bar{x}$ and $\bar{y}/\bar{z} \geq 1.05$;

(3) a higher elongation at rupture in the direction of flexibilization;

(4) a $\bar{Y}$-axial water vapor permeability of not more than 1.5 g/m^2-hr by the water method of ASTM C-355, and

(5) with the further limitation that the flexibilized sheet is of generally closed cell structure.

7. The directionally flexibilized closed-cell foam sheet prepared by the process of claim 1.

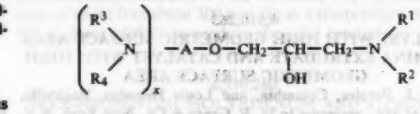
4,510,269

PROCESS FOR THE PRODUCTION OF OPTIONALLY CELLULAR POLYURETHANES

Richard Kopp, Cologne, and Hans-Albrecht Freitag, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 638,160
Claims priority, application Fed. Rep. of Germany, Aug. 16, 1983, 3329452
Int. Cl.³ C08G *18/14*
U.S. Cl. 521—166 **10 Claims**

1. A process for the production of an optionally cellular polyurethane by reacting at least one compound having at least two hydrogen atoms which are reactive with isocyanate groups and have a molecular weight of from about 400 to 10,000 with polyisocyanates in the presence of a poly-(dialkylaminolalkyl) ether catalyst corresponding to the formula



wherein

A represents a straight-chain or branched-chain (x+1)-valent, optionally substituted C_2–C_6 alkyl radical,

x represents an integer of 1 to 4 and

R^1–R^4 represent the same or different C_1–C_4 alkyl radicals, which optionally form a heterocyclic radical with N.

4,510,270

ANAEROBIC ADHESIVES HAVING EXCELLENT ADHESIVE PROPERTY AND PRESERVATIVE STABILITY

Takanori Okamoto; Hisakazu Mori, and Hideaki Matsuda, all of Kagawa, Japan, assignors to Okura Kogyo Kabushiki Kaisha, Japan

Filed Jun. 29, 1984, Ser. No. 626,115
Claims priority, application Japan, Jul. 30, 1983, 58-138730
Int. Cl.³ C08K *3/32*; C08L *33/06*; C09J *1/00, 3/14*
U.S. Cl. 523—176 **7 Claims**

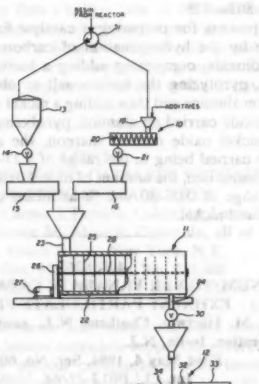
1. A one-part type anaerobic adhesive, which comprises an organic peroxide, a hardening accelerator, an anaerobically polymerizable monomer which does not harden in the presence of air but hardens in the absence of air, and polyphosphoric acid in an amount of at least 0.001% by weight based on the total amount of the anaerobic adhesive.

4,510,271

METHOD OF FINISHING THERMOPLASTIC GRANULES

Mike E. Muhle, Kingwood; Richard J. Stolz, LaPorte, and Cecil W. Wright, Baytown, all of Tex., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Filed Oct. 27, 1982, Ser. No. 437,055
Int. Cl.³ C08J *3/20*
U.S. Cl. 523—346 **16 Claims**



1. A method of finishing polyolefin thermoplastic granules which comprises:

(a) blending the thermoplastic granules with additive material at a ratio wherein the additive material comprises

from about 0.001 to 40 weight percent of the blend, and at a temperature below the softening point of the thermoplastic to form a masterblend;

(b) continuously introducing the masterblend and additional polyolefin thermoplastic resin into an intensive mixer in a resin/masterblend weight ratio of between about 5:1 to 50:1, and mixing the masterblend and additional thermoplastic granules therein under conditions (i) to increase the temperature of the thermoplastic to its softening point but below its fluxing temperature whereby additive material is embedded into or onto substantially all the granules and (ii) to increase the bulk density of the blend by at least 5 percent without producing excessive fines; and

(c) continuously withdrawing and cooling the mixture from the intensive mixer to from free-flowing discrete particles.

4,510,272

BIS-MALEIMIDE-EPOXY COMPOSITIONS AND PREPREGS

Raymond C. Loszewski, Windham, N.H., assignor to Avco Corporation, Wilmington, Mass.

Filed Mar. 16, 1983, Ser. No. 475,836

Int. Cl.³ C08G *59/40, 83/00*

U.S. Cl. 523—400 **76 Claims**

1. A resinous composition comprising an admixture of an unsaturated polyimide essentially free of terminal amine groups and an epoxy having a homopolymerization temperature greater than the temperature at which the polyimide polymerizes.

4,510,273

THIXOTROPIC AGENT

Yoshikazu Miura, Ichihara; Koji Horimoto, Iwakuni, and Takenori Sumida, Tokyo, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Continuation of Ser. No. 308,908, Oct. 5, 1981, abandoned, which is a continuation-in-part of Ser. No. 205,159, Nov. 10, 1980, abandoned. This application Dec. 2, 1982, Ser. No. 446,354

Claims priority, application Japan, Nov. 8, 1979, 54-144834

Int. Cl.³ C08K *3/20*

U.S. Cl. 523—406 **5 Claims**

1. A method of providing thixotropy to a liquid which comprises adding to the liquid 0.05 to 8 phr of a polyolefin fiber synthetic pulp having a D.F. (Drainage Factor) of 0.03 to 8 second/gramm, F.F. (Floating Factor) of 100 ml or less, an average diameter of 0.1 to 10 micron and a C.F.L. (Classified Fiber Length) of 0.01 to 0.2 mm.

4,510,274

VINYL ACETATE-ETHYLENE COPOLYMER EMULSION AND AQUEOUS EMULSION ADHESIVE COMPOSITION CONTAINING THE EMULSION

Haruo Okazaki, Ichihara, and Takashi Ohkubo, Chiba, both of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 277,451, Jun. 25, 1981, abandoned. This application Jan. 12, 1983, Ser. No. 457,613

Int. Cl.³ C08L *33/00*

U.S. Cl. 523—411 **23 Claims**

4. An aqueous emulsion adhesive comprising an emulsion of a quarterly vinyl acetate-ethylene copolymer emulsified in an aqueous medium, and containing 100 parts, by weight, based on solid contents, 2.5 to 30 parts, by weight, of a nitrogen-containing resin, said nitrogen-containing resin being polycondensation products of polyalkylenepolyamines and the polymerization products of the mixture substantially obtained from oleic acid, linoleic acid and tall oil, said polycondensation products and polymerization products having the amine values of from 20 to 900, and 2.5 to 50 parts, by weight, of an epoxy resin,

said quarterly copolymer comprising a formulation of

100 parts, by weight, of a vinyl acetate-ethylene copolymer prepared from 95 to 60 parts, by weight, of vinyl acetate monomer (I) and 5 to 40 parts, by weight, of ethylene monomer (II);

0.5 to 7 parts, by weight, of an acid monomer (III) selected from the group consisting of acrylic acid monomer, methacrylic acid monomer, itaconic acid monomer, maleic acid monomer, and fumaric acid monomer, and mixtures thereof; and

0.5 to 15 parts, by weight, of a water-insoluble acrylamide compound (IV) selected from the group consisting of N-N-butoxymethylacrylamide, N-isobutoxymethylacrylamide, and N-methylolacrylamide-2-ethylhexyl ether.

4,510,275

NOVEL AQUEOUS COATING COMPOSITION

Shinichi Ihikura, Kyoto; Kazunori Kanda, Yao, and Toshiharu Nakaya, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Jul. 9, 1982, Ser. No. 396,864

Claims priority, application Japan, Jul. 21, 1981, 56-114686

Int. Cl.³ C08L *63/00*

U.S. Cl. 523—412 **6 Claims**

1. An aqueous coating composition consisting essentially of a water medium and, as film-forming components, at least one water soluble resin and at least one water-insoluble finely pulverized resin, the weight ratio, in terms of solid matter, of said water soluble resin to said water-insoluble resin being 98:2–45:55, and at least one of said water soluble resins fulfilling the requirements that the water tolerance, expressed in terms of the water dilution multiplicand of the resin for the solution, which is incapable of reading out a defined type, is more than 4, said water tolerance being measured by a test wherein 5 g of aqueous varnish having a normal viscosity as employed in the manufacture of coating compositions, are weighed in a 100 ml beaker, and mixed together, with an increasing amount of deionized water being added thereto and then a No. 1 type, 26 point type, is read through the beaker, to determine said water tolerance, and wherein the surface tension of a 1 wt. % aqueous solution is less than 51 dyne/cm, said water soluble resin being selected from the group consisting of an alkyd resin, a polyester resin, an acrylic resin, an epoxy resin, a maleic oil resin, a maleic polyalkadiene resin, a urethane resin, and an aminoplast resin, said water soluble resin having an average molecular weight of 500 to 20,000 and wherein said water soluble resin contains 0.3 to 5 m mol/g of hydrophilic functional groups in its structure which hydrophilic groups are neutralized with either an acid or basic solubilizing compound; and wherein the finely pulverized water-insoluble resin is selected from the group consisting of an epoxy resin, a polyester resin, an acrylic resin, an alkyd resin, an oil-free alkyd resin, a phenol resin, a polyether resin, a polyalkadiene resin, a vinyl resin, a polyamide resin, a polycarbonate resin, a fluorine resin, and an aminoplast resin, said finely pulverized water-insoluble resin having a softening point of 5° to 120° C. and wherein the mean diameter of the resin particles is in the range of 0.5 to 500μ.

4,510,276

EPOXY RESIN COATING COMPOSITIONS FOR PRINTED CIRCUIT BOARDS

Edward J. Leech, Oyster Bay, and Frank D. Russo, West Sayville, both of N.Y., assignors to Kollmorgen Technologies Corporation, Dallas, Tex.

Continuation-in-part of Ser. No. 103,340, Dec. 13, 1979, abandoned, which is a continuation-in-part of Ser. No. 3,099, Jan. 12, 1979, abandoned. This application Dec. 14, 1979, Ser. No. 103,600

Int. Cl.³ C08L *63/00, 63/10*

U.S. Cl. 523—427 **18 Claims**

1. In a permanent, protective coating composition useful in the manufacture of printed circuit boards, said coating composition comprised of a thermosetting epoxy resin and curing

composition dissolved in a solvent; and a flow promoter; said curing composition present in an amount sufficient to effect substantially complete cure of said thermosetting resin, said coating composition being in an initial state as a high viscosity solution and having an apparent viscosity between about 10,000 centipoise and about 200,000 centipoise, said coating composition upon curing, being transformed from said initial state into a final state as a solid, the improvement which comprises:

said composition further including a thickening agent in an amount sufficient to gel said high viscosity solution into a soft gel-like initial state, said composition, upon curing, being transformed from said soft gel-like initial state directly into a cross-linked solid;

said thermosetting epoxy resin being a solid at room temperature, having a melting point between 60° C. and about 200° C., and having an epoxide functionality greater than about 3;

said curing composition including:

a primary curing agent comprised of an alicyclic polyamine which is corrosive to copper surfaces, the primary curing agent being present in an amount sufficient to effect substantially complete cure of the thermosetting epoxy resin; and

a secondary curing agent comprised of an aromatic amine, said secondary curing agent being present in an amount sufficient to provide said cured coating composition with resistance to flux removal processes.

4,510,277

PROCESS FOR IMPROVING MOISTURE RESISTANCE OF EPOXY RESINS BY ADDITION OF CHROMIUM IONS

Anne K. St. Clair; Diane M. Stoakley; Terry L. St. Clair, all of Poquoson, and Jag J. Singh, Yorktown, all of Va., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 3, 1983, Ser. No. 548,583

Int. Cl.³ C08G *59/40, 59/70*

U.S. Cl. 523—454 **14 Claims**

1. A method for preparing a chromium ion-containing epoxy resin comprising:

adding a quantity of chromium ions to an epoxide based upon the diglycidyl ether of bisphenol A (DGEBA) that has been previously preheated to the temperature of 130°–135° C.; and,

while maintaining this temperature range, adding an amine curing agent to the epoxide-chromium mixture and further heating to cure the mixture to obtain a chromium ion-containing epoxy useful as an adhesive, composite matrix or as a casting and that has improved moisture resistance over epoxies having no chromium ions therein.

4,510,278

MANUFACTURE OF CHIPBOARD AND A NOVEL SUITABLE BONDING AGENT

Jan J. Hoetjer, Ten Boer, Netherlands, assignor to Methanol Chemie Nederland V.o.F., Haren, Netherlands

Continuation of Ser. No. 366,309, Apr. 7, 1982,. This application Feb. 1, 1984, Ser. No. 576,164

Claims priority, application Netherlands, Apr. 7, 1981, 8101700

Int. Cl.³ B29J *5/00*

U.S. Cl. 524—14 **10 Claims**

1. In a method for the preparation of particleboard wherein a cellulose-containing particulate material is provided with a urea-formaldehyde resin bonding agent and thereafter shaped and hardened at an elevated temperature and pressure, the improvement wherein said bonding agent is a urea-formaldehyde resin solution additionally containing melamine in an amount of between 1.0 and 10 percent by weight, relative to the total amount of resin solids, wherein the molar ratio of formaldehyde to mole equivalents of amino groups is in the range of between 0.500:1 and 0.575:1.

4,510,279

METHACRYLATE RESIN COMPOSITION FOR OPTICAL INFORMATION RECORDING MEDIUM

Masaaki Kishimura, Iwakuni, and Nobuyuki Arakawa, Yokohama, both of Japan, assignors to Mitsubishi Rayon Co., Ltd. and Sony Corporation, both of Tokyo, Japan

Filed Aug. 6, 1982, Ser. No. 405,740

Claims priority, application Japan, Aug. 12, 1981, 56-126364

Int. Cl.³ C08L *33/10, 33/12*

U.S. Cl. 524—144 **6 Claims**

1. A transparent methacrylate resin composition consisting of a melt blended mixture of (A) 100 parts by weight of a transparent methyl methacrylate homopolymer or copolymer containing not less than 70% by weight of copolymerized methyl methacrylate and (B) 0.1 to 3.0 parts by weight of an organic compound which is a surface active agent having a perfluoroalkyl group of 3 to 12 carbon atoms, said composition being suitable for optical information recording medium, said perfluoroalkyl group containing organic surface active agent having the property of being melt blendable with component (A) in the above specified parts by weight to improve mold releasability of component (A) while retaining the transparency of the composition.

4,510,280

THERMOPLASTIC PVC MOLDING COMPOSITIONS

Jesse D. Jones, and Edwin D. Hornbaker, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Nov. 24, 1980, Ser. No. 209,843

Int. Cl.³ C08L *27/06, 25/08, 51/04, 55/02*

U.S. Cl. 524—178 **16 Claims**

1. A thermoplastic composition which comprises in intimate admixture:

(a) a vinyl chloride polymer having a relative viscosity as measured at a concentration of 1 gram per 100 grams of cyclohexanone at 25° C. falling within the range of about 1.50 to about 1.85; and

(b) a rubber-modified graft copolymer of a vinyl aromatic compound and an α,β-unsaturated cyclic anhydride in which the relative proportions of said compound and said anhydride fall within the range of about 91 to about 70 weight percent of said compound and about 9 to about 30 weight percent of said anhydride, and in which the graft copolymer contains up to 33 parts by weight of the rubber per 100 parts by weight of the copolymer; and

(c) a tin-containing stabilizer and an impact modifier for vinyl chloride polymers;

with the proviso that said admixture contains 60 to 35 weight percent of (a) and 40 to 65 weight percent of (b) and the further proviso that the blend has the following properties:

(d) an Izod impact strength (ASTM D 256, Method A) of at least 0.5 foot pound per inch;

(e) a heat deflection temperature (ASTM D 648) at 66 psi of at least 75° C.; and

(f) a dynamic thermal stability of at least 10 minutes.

4,510,281

TACK-FREE POLYMER PELLETS

Malcolm S. Smith, Orange, Tex., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 472,644, Mar. 7, 1983, abandoned, which is a continuation-in-part of Ser. No. 348,012, Feb. 16, 1982, abandoned, which is a continuation-in-part of Ser. No. 267,082, May 26, 1981, abandoned. This application Dec. 19, 1983, Ser. No. 563,231

Int. Cl.³ C08K *5/20*

U.S. Cl. 524—229 **14 Claims**

1. A pellet of a polymer selected from the group consisting of:

(a) copolymers of ethylene with vinyl acetate in which the amount of vinyl acetate is about 18–55 weight percent,

(b) terpolymers of ethylene with vinyl acetate and carbon monoxide in which the amount of vinyl acetate is about 20–40 weight percent and the amount of carbon monoxide is about 3–12 weight percent,

(c) copolymers of ethylene with methacrylic acid in which the amount of methacrylic acid is about 6–30 weight percent, the carboxyl groups of the copolymers being neutralized with zinc ions to an extent of 0 to about 50%,

(d) copolymers of ethylene with methyl methacrylate in which the amount of methyl methacrylate is about 18–40 weight percent, and

(e) terpolymers of ethylene with n-butyl acrylate and carbon monoxide in which the amount of n-butyl acrylate is about 20–40 weight percent, and the amount of carbon monoxide is about 3–15 weight percent;

the stick temperature of the copolymers of paragraph (a) being at most about 40° C., and the stick temperature of the polymers of paragraphs (b) through (e) being below about 60° C.;

said pellet having incorporated into the copolymer an effective amount from about 500 to about 10000 parts by weight per million parts by weight of the polymer (ppm) of an additive selected from the group consisting of N,N'-ethylenebisoleamide, N,N'-ethylenebiserucamide, N,N'-dioleyladipamide, and N,N'-dierucyladipamide to reduce the tackiness of the pellet;

with the proviso that when the polymer in the pellet is a dipolymer with vinyl acetate, it may also contain blended therewith wax in an amount of up to about 13% of the copolymer weight.

4,510,282

AQUEOUS DISPERSIONS FOR COATING MATERIALS

Werner Goll, Garching, Fed. Rep. of Germany, assignor to SKW Trostberg Aktiengesellschaft, Trostberg, Fed. Rep. of Germany

Continuation of Ser. No. 340,472, Jan. 18, 1982, abandoned. This application May 10, 1983, Ser. No. 491,345

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1981, 3102169

Int. Cl.³ C08L *27/16*

U.S. Cl. 524—337 **36 Claims**

1. An aqueous dispersion for the production of corrosion- and weather-resistant coatings on work materials, especially synthetic fiber fabrics, said aqueous dispersion comprising:

20 to 50% by weight polyvinylidene fluoride,

20 to 50% by weight water,

1.5 to 25% by weight of an acrylic co-polymer in the form of a water-soluble co-polymer of acrylic acid and/or methacrylic acid and one or more monomers co-polymerizable therewith and selected from the group consisting of acrylamide, methacrylamide, acrylonitrile, methyl acrylate, methyl methacrylate, ethyl acrylate, ethyl methacrylate, butyl acrylate, butyl methacrylate, styrene, butadiene and vinyl acetate,

1.5 to 5% by weight of a pigment and/or a filling material,

0.05 to 0.75% by weight, referred to the polyvinylidene fluoride, of a UV-light-protection agent and

4 to 20% by weight of a low boiling alcohol or of a mixture of a low boiling alcohol and of a high boiling solvent said mixture containing up to 50% of the high boiling solvent.

4,510,283

SILICONE-TYPE COATING RESIN SOLUTION

Shiro Takeda, and Minoru Nakajima, both of Sagamihara, Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Dec. 12, 1983, Ser. No. 560,170

Claims priority, application Japan, Dec. 16, 1982, 57-219174

Int. Cl.³ C08K *5/07*

U.S. Cl. 524—356 **18 Claims**

1. A silicone coating resin organic solvent solution comprising

30 to 60 parts by weight of a hydrolytic condensation polymer of tetramethoxysilane or tetra-ethoxysilane having a weight average molecular weight of 1,000 to 6,000,

70 to 40 parts by weight of a polysilsesquioxane prepolymer having a weight average molecular weight of 2,500 to 7,000, in which each of 5 to 50 mole% of the organic groups attached directly to the silicon atoms of the polysilsesquioxane prepolymer is a phenyl group and the remaining organic groups are methyl, ethyl, or vinyl groups, and

said solvent being an organic compound having a boiling point of not less than 100° C. under a pressure of 760 mmHg.

4,510,284

HIGH SOLIDS BAKING FINISHES

Jürgen Gimpel, Ludwigshafen; Klaus-Peter Jäckel, Limburgerhof, and Hans Sander, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Fed. Rep. of Germany

Continuation of Ser. No. 446,065, Dec. 1, 1982, abandoned. This application Aug. 7, 1984, Ser. No. 638,540

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1981, 3148051

Int. Cl.³ C08F *20/04*

U.S. Cl. 524—379 **12 Claims**

1. A baking finish dissolved in conventional organic solvents, which baking finish is based on hydroxyl-containing copolymers and is useful as a top coat for multilayer coatings, wherein the binder of said finish is a copolymer obtained from

(A) from 18 to 27% by weight of one or more monoacrylate or monomethacrylate of an alkanediol of 2 to 4 carbon atoms,

(B) from 28 to 45% by weight of an acrylate or methacrylate of a monoalcohol of 3 to 8 carbon atoms, the homopolymer of which ester has a glass transition temperature of below −40° C.,

(C) from 32 to 50% by weight of an acrylate or methacrylate whose homopolymer has a glass transition temperature of above 35° C. and

(D) from 0.5 to 3% by weight of acrylic or methacrylic acid, with the proviso that the sum of the percentages given under (A) to (D) is 100 and the Fikentscher K value of the copolymer is from 13 to 17.

4,510,285

TERPOLYMERIC ANTITUMOR AGENT

Edward H. Mottus, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 274,596, Jun. 17, 1981,. This application Oct. 7, 1983, Ser. No. 540,088

Int. Cl.³ C08K *3/16*; C08F *222/06*

U.S. Cl. 524—401 **6 Claims**

1. An antitumor active, water-soluble composition of matter selected from the group consisting of amide and imide derivatives of a low molecular weight terpolymer of butyl vinyl ether, maleic anhydride and maleimide wherein said molecular weight is less than about 3000, the maleimide comprises from about 5 mol % to about 40 mol % of the total of maleic anhydride and maleimide and the derivatized groups comprise from about 5 weight % to about 25 weight % imide, and the phar-

maceutically acceptable cationic salt derivatives of said derivatized terpolymer.

4,510,286

BONDING RESIN COMPOSITION

Chia-Seng Liu, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation-in-part of Ser. No. 414,695, Sep. 3, 1982, abandoned. This application Apr. 25, 1984, Ser. No. 603,804

Int. Cl.³ C08L *35/00, 51/06*

U.S. Cl. 525—71 **8 Claims**

1. A bonding resin composition composed of a blend consisting essentially of

(a) maleic anhydride-modified, stereoregular polypropylene in which the combined maleic anhydride is from about 0.2 to about 0.8 percent by weight of said modified polypropylene; and

(b) base polymer material at a concentration of from about 4 to about 70 parts by weight per part by weight of said maleic anhydride-modified polypropylene, and selected from the group consisting of

(i) stereoregular polypropylene and essentially crystalline, sequentially polymerized propylene-ethylene product comprising a blend of propylene homopolymer, ethylene homopolymer, and random copolymers of propylene and ethylene, and having a combined ethylene content of from about 15 to about 30 percent by weight, the weight ratio of said polypropylene to said product being about 1:4 to about 4:1, and

(ii) essentially crystalline sequentially polymerized propylene-ethylene product having a combined ethylene content of from about 0 to about 14 percent by weight, and essentially crystalline sequentially polymerized propylene-ethylene product comprising a blend of propylene homopolymer, ethylene homopolymer, and random copolymers of propylene and ethylene, and having a combined ethylene content of from about 15 to about 30 percent by weight, the weight ratio of these two products being about 1:4 to about 4:1.

4,510,287

ABS COMPOSITIONS AND PROCESS FOR PREPARING SAME

Wan C. Wu, Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Nov. 21, 1983, Ser. No. 553,717

Int. Cl.³ C08L *55/02*

U.S. Cl. 525—84 **4 Claims**

1. An ABS intermediate for use in a polyblend, said intermediate consisting essentially of a copolymer of styrene and acrylonitrile grafted onto a preformed rubber substrate which is dispersed in ungrafted matrix copolymer of styrene and acrylonitrile, said copolymer of the graft and said matrix copolymer each containing 60 to 85 weight styrene and 15 to 40 weight % polymerized acrylonitrile, the weight percent of surface-grafted acrylonitrile in the copolymer being different by at least 2.0% from the weight percent polymerized acrylonitrile in the matrix copolymer.

4,510,288

CYCLIC AMIDINES, A PROCESS FOR THEIR PRODUCTION AND THEIR USE AS CATALYSTS IN THE HARDENING OF EPOXIDE RESINS

Rolf-Volker Meyer; Hans-Joachim Kreuder, and Erwin Hohl, all of Krefeld, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

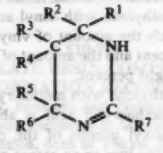
Filed Mar. 16, 1983, Ser. No. 475,710

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1982, 3211301

Int. Cl.³ C08L *59/58*; C07D *239/02*

U.S. Cl. 525—111 **6 Claims**

1. Compounds corresponding to the following formula (2):



(2)

in which

R^1 to R^6 independently of one another represent a hydrogen atom, a C_1–C_4-alkyl, C_5–C_{10}-cycloalkyl, C_7–C_{13}-aralkyl or a C_6–C_{18}-aryl group or two substituents R^1/R^2, R^3/R^4, R^5/R^6,

R^1/R^3 or R^1/R^5 together represent a C_1–C_5-alkylene radical,

R^7 represents an aliphatic, cycloaliphatic, araliphatic or aromatic radical containing from 1 to 36 carbon atoms which is either substituted by COOH or NR^9R^{10}, or interrupted by a keto group or by 1 to 10 amide or ester groups;

R^9 and R^{10} independently of one another represent a hydrogen atom or a C_1–C_{12}-alkyl or C_6–C_8-cycloalkyl group or both substituents together represent a C_4–C_6-alkylene group.

4,510,289

POLYCARBONATE/CONDENSATION POLYMER BLENDS

Daniel W. Fox, Pittsfield; Edward N. Peters, Lenox, and Gary F. Smith, Pittsfield, all of Mass., assignors to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 259,524, May 1, 1981, abandoned. This application Dec. 20, 1982, Ser. No. 451,180

Int. Cl.³ C08L *69/00*

U.S. Cl. 525—148 **17 Claims**

1. A thermoplastic resin composition comprising:

(a) a mixed polycarbonate consisting of units derived from a first dihydric phenol, which is a bis(hydroxyaryl)sulfone, and a second dihydric phenol, said first and second dihydric phenols being in a mole ratio of 1:5 to 7:3; and

(b) a thermoplastic condensation polymer comprising an aromatic polycarbonate, said composition having been admixed to produce a compatible composition.

4,510,290

ACID-CURABLE COMPOSITION CONTAINING A MASKED CURING CATALYST, AND A PROCESS FOR THE CURING THEREOF

Rudolf Kirchmayr, Aesch, and Werner Rutsch, Reinach, both of Switzerland, assignors to Ciba Geigy Corporation, Ardsley, N.Y.

Filed Jan. 3, 1983, Ser. No. 455,173

Claims priority, application Switzerland, Jan. 11, 1982, 123/82; Aug. 31, 1982, 5174/82

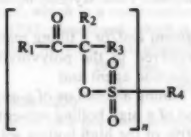
Int. Cl.³ C08L *61/28*

U.S. Cl. 525—162 **14 Claims**

1. A curable composition which comprises

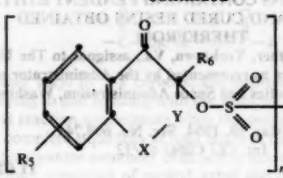
(a) an acid-curable resin which is an amino resin or a phenolic resin, or a mixture of an amino resin or a phenolic resin with an alkyd, polyester or acrylic resin, and

(b) an effective amount of a curing catalyst which is a compound of formula I or II



I

-continued



II

in which n is the number 1 or 2 and R_1 is phenyl or naphthyl which is unsubstituted or substituted by 1, 2 or 3 radicals belonging to the group comprising —Cl, —Br, —CN, —NO_2, C_1–C_{12}-alkyl, C_1–C_4-alkoxy, phenoxy, tolyloxy, phenylthio, tolylthio, C_1–C_8-alkylthio, —SCH_2CH_2OH, C_1–C_4-alkylsulfonyl, phenylsulfonyl, C_2–C_4-alkoxycarbonyl, C_1–C_4-alkylamino, C_2–C_4-dialkylamino, phenyl—CONH, C_1–C_4-alkyl-CONH— or benzoyl, or R_1 is also anthryl, phenanthryl, thienyl, pyridyl, furyl, indolyl or tetrahydronaphthyl, and R_2 is hydrogen or C_1–C_8-alkyl which is unsubstituted or substituted by —OH, —Cl, C_1–C_4-alkoxy, —CN, C_2–C_5-alkoxycarbonyl, phenyl, chlorophenyl, C_7–C_{10}-alkylphenyl or C_7–C_{10}-alkoxyphenyl, or is also benzoyl, R_3 is as defined for R_2 and is also phenyl which is unsubstituted or substituted by —Cl, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylthio, C_2–C_8-alkoxycarbonyl, —CN, C_1–C_4-alkyl-NHCO—, phenyl-NHCO— or —$CONH_2$, or R_2 and R_3, together with the carbon atom to which they are attached, constitute a C_4–C_6-cycloalkyl ring, X is —O—, —S—, —SO_2—, —CH_2—, —$C(CH_3)_2$— or >N-COR_7, R_7 being C_1–C_4-alkyl or phenyl, and Y is a direct bond or —CH_2—, and, if n=1, R_4 is C_1–C_{18}-alkyl, phenyl which is unsubstituted or substituted by halogen, C_1–C_{12}-alkyl, C_1–C_4-alkoxy, C_1–C_4-alkyl-CONH—, phenyl-CONH—, —NO_2 or benzoyl, naphthyl which is unsubstituted or substituted by halogen, C_1–C_{12}-alkyl or C_1–C_4-alkoxy, C_5–C_6-cycloalkyl, C_7–C_9-aralkyl, camphoryl, —CF_3, —CCl_3, —F or —NH_2, and, if n=2, R_4 is a —$(CH_2)_m$— group in which m is the number 2 to 8, or R_4 is phenylene or naphthylene which is unsubstituted or substituted by C_1–C_{12}-alkyl, R_5 is H or 1, 2 or 3 radicals belonging to the group comprising —Cl, —Br, —NO_2, C_1–C_{12}-alkyl, C_1–C_4-alkoxy, phenoxy, phenylthio, C_1–C_8-alkylthio or —SCH_2CH_2OH, and R_6 is hydrogen or C_1–C_8-alkyl which is unsubstituted or substituted by —OH, —Cl, C_1–C_4-alkoxy, —CN, C_2–C_5-alkoxycarbonyl, phenyl, chlorophenyl, C_7–C_{10}-alkylphenyl or C_7–C_{10}-alkoxy-phenyl, phenyl which is unsubstituted or substituted by —Cl, C_1–C_4-alkyl, C_1–C_4-alkoxy or C_1–C_4-alkylthio, C_2–C_8-alkoxycarbonyl or —CN.

4,510,291

RUBBER COMPOSITIONS FOR TIRE TREADS

Kinya Kawakami, Ninomiya, Japan, assignor to The Yokohama Rubber Co., Ltd., Tokyo, Japan

Filed Sep. 7, 1983, Ser. No. 529,962

Claims priority, application Japan, Sep. 9, 1982, 57-155853

Int. Cl.³ C08L *9/00, 9/06*

U.S. Cl. 525—237 **2 Claims**

1. A rubber composition for tire treads which comprises as the rubber ingredients (I) a styrene-butadiene copolymer rubber having a styrene content of 30–60% by weight, (II) a polybutadiene rubber having a trans 1,4-bonded butadiene content of at least 60% by weight and a glass transition temperature of from −100° C. to −50° C. and (III) a styrene-butadiene copolymer rubber having a styrene content of 5–25% by weight and a 1,2-bonded butadiene content of 20–60% by weight of the butadiene portion of the rubber (III), in such amounts that the styrene-butadiene copolymer rubber (I) and polybutadiene rubber (II) are present in a total amount of 20–80% by weight of the whole of the rubber ingredients, the styrene-butadiene copolymer rubber (III) is present in an amount of 80–20% by weight of the whole of the rubber ingredients and the styrene content of the rubber (I) is equal to 5–25% by weight of the total of the rubbers (I) and (II).

4,510,292

ETHYLENE-PROPYLENE COPOLYMERS FOR FOAMING AND PROCESS FOR PRODUCING THE SAME

Hiromasa Chiba; Kenjiro Obama; Shunji Kawazoe; Takahiro Oka, and Akihiro Satoh, all of Ichiharashi, Japan, assignors to Chisso Corporation, Osaka, Japan

Filed Aug. 11, 1983, Ser. No. 522,013

Claims priority, application Japan, Aug. 24, 1982, 57-146592

Int. Cl.³ C08F *297/08*

U.S. Cl. 525—247 **4 Claims**

1. In a process for producing a block copolymer by copolymerizing propylene with ethylene in the presence of a catalyst comprising a titanium trichloride composition and an organoaluminum compound and a molecular weight modifier, the improvement which comprises:

(a) polymerizing propylene in two steps so that the resulting propylene homopolymer portion will consist of a lower molecular weight portion and a higher molecular weight portion, the intrinsic viscosity $[\eta]_H$ of said higher molecular portion and the intrinsic viscosity $[\eta]_L$ of said lower molecular weight portion having the relationship expressed by the following equation:

$$3.5 \leqq [\eta]_H - [\eta]_L \leqq 7.0$$

said propylene homopolymerization is carried out so that the proportions of said lower molecular weight portion and said higher molecular weight portion are 40 to 60% and 60 to 40% by weight, respectively,

(b) in a subsequent stage copolymerizing ethylene with propylene, in the presence of said propylene homopolymer portion, into a block copolymer consisting of said propylene homopolymer portion and an ethylene-propylene copolymer portion, the ethylene being polymerized with propylene so that the molecular weight of said ethylene-propylene copolymer portion will have a value between the molecular weights of said lower molecular weight portion and said higher molecular portion in said propylene homopolymer portion, and so that ethylene-propylene copolymer portion will have an ethylene content of 60–95% by weight based on said copolymer portion, and

(c) controlling the amounts of the respective polymer portions polymerized and the MFR and the HMFR of the total polymer so that:

(i) the relationship between the melt flow rate (MFR) under a load of 2.16 Kg at 230° C. of the resulting block copolymer and the melt flow rate (HMFR) of the block copolymer under a load of 10.20 Kg at 230° C. is log HMFR ≧ 0.922 log MFR + 1.44,

(ii) said block copolymer has an ethylene content of 10 to 40% by weight.

4,510,293

PROCESS FOR HYDROGENATING CONJUGATED DIENE POLYMERS

Yoichiro Kubo; Takaaki Kohtaki, both of Yokohama, and Kiyomori Oura, Kamakura, all of Japan, assignors to Nippon Zenn Co. Ltd., Tokyo, Japan

Filed Dec. 13, 1983, Ser. No. 561,033

Claims priority, application Japan, Dec. 23, 1982, 57-225023

Int. Cl.³ C08F *8/04*

U.S. Cl. 525—338 **7 Claims**

1. In a process for catalytically hydrogenating a carbon-carbon double bond of a conjugated diene polymer by introducing hydrogen in the solution of said polymer, the improvement

wherein a palladium salt of the hydrogenation carboxylic acid is used as the essential hydrogenation catalyst.

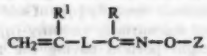
4,510,294

POLYMERIZATION OF MONOMERIC HYDROGEN-BLOCKED OXIME DERIVATIVES

Lloyd D. Taylor, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jul. 2, 1982, Ser. No. 394,543
Int. Cl.[3] C08F 8/12
U.S. Cl. 525—369 17 Claims

1. A process for preparing a polymeric oxime which comprises polymerizing a polymerizable hydrogen-blocked derivative of an ethylenically unsaturated monomeric oxime to provide a polymer comprising recurring units from said polymerizable hydrogen-blocked derivative, said hydrogen-blocked derivative having the formula



wherein R is hydrogen, lower alkyl, aryl, aralkyl or alkaryl, R^1 is hydrogen or lower alkyl, L is a divalent organic linking group and Z is a hydrogen-blocking group capable of being replaced by a hydrogen atom; and replacing hydrogen-blocking Z groups of said polymer with hydrogen atoms to provide a polymer containing oximino groups.

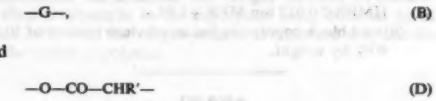
4,510,295

ABSORBABLE POLYMERS OF SUBSTITUTED BENZOIC ACID

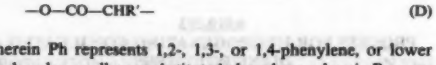
Rao S. Bezwada, Whitehouse Station; Shalaby W. Shalaby, Mountainville, and Dennis D. Jamiolkowski, Long Valley, all of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Jan. 20, 1983, Ser. No. 459,428
Int. Cl.[3] C08G 63/18, 63/66
U.S. Cl. 525—437 22 Claims

1. An absorbable, radiation sterilizable, normally solid polymer comprising a copolyester comprising the repeating divalent units of the formula:

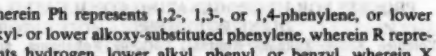


(A)



(B)

and



(D)

wherein Ph represents 1,2-, 1,3-, or 1,4-phenylene, or lower alkyl- or lower alkoxy-substituted phenylene, wherein R represents hydrogen, lower alkyl, phenyl, or benzyl, wherein X represents oxy, thio, or sulfonyl, wherein G represents the residue after removal of the alcohol groups of a dihydric alcohol, wherein R' represents hydrogen or methyl, and wherein said divalent units (A), (B), and (D) are bonded to each other through ester groups formed by linking said units, wherein the units (A) plus (B) are present in said polymer in an amount of from about 1 to about 70 parts by weight per 100 parts by weight of the units (D).

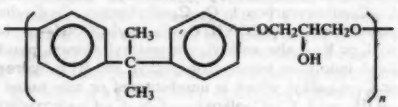
4,510,296

PHENOXY RESINS CONTAINING PENDENT ETHYNYL GROUPS AND CURED RESINS OBTAINED THEREFROM

Paul M. Hergenrother, Yorktown, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed May 10, 1984, Ser. No. 608,741
Int. Cl.[3] C08G 65/32
U.S. Cl. 525—534 11 Claims

1. A phenoxy resin composition having long shelf-life and undergoes branching and crosslinking upon the application of heat to yield a cured product having improved solvent resistance and high use temperature and formed as the reaction product of a phenoxy resin having the general formula of



where n=20–200 repeating units and at least 10 mole % of an ethynyl-substituted aryl acid chloride.

4,510,297

MELT CURING ARYLENE SULFIDE POLYMERS WITH OXYGEN

Charles W. Moberly, c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Jan. 12, 1984, Ser. No. 570,108
Int. Cl.[3] C08G 75/14
U.S. Cl. 525—537 8 Claims

1. A method for treating arylene sulfide polymer comprising stirring melted polymer in a vessel while contacting said polymer with oxygen for a time sufficient to decrease the melt flow to obtain a product of increased viscosity.

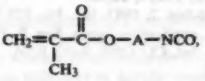
4,510,298

PROCESS FOR MAKING ISOCYANATE-FUNCTIONAL POLYMERS CONTAINING LOW RESIDUAL MONOMERIC ISOCYANATE

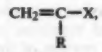
Roland G. Lindsey, Springfield, Pa., and John A. Simms, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 313,585, Oct. 21, 1981, abandoned. This application Apr. 13, 1983, Ser. No. 484,558
Int. Cl.[3] C08F 6/10, 120/00
U.S. Cl. 526—87 5 Claims

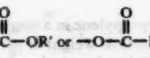
1. In the process of polymerizing a substantially anhydrous mixture containing at least one polymerizable monomer having the formula



in which A is alkylene of 2–14 carbons, the monomer being polymerized alone or with at least one compound of the formula



in which R is hydrogen or methyl and X is phenyl, tolyl, cyano,



R' being alkyl of 1–8 carbons; the improvement comprising supplying to and reacting with the reacting polymerizing mixture at reaction temperature when the polymerization is about 98% complete a quantity at least equal to the quantity of unreacted isocyanate monomer of an active monomer selected from the group consisting of methyl, ethyl and butyl acrylates and fumarates.

4,510,299

POLYMERIZATION METHOD

Michael W. Lynch, Schaumburg, and Thomas J. Pullukat, Hoffman Estates, both of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Division of Ser. No. 363,105, Mar. 29, 1982, Pat. No. 4,455,386. This application Jul. 29, 1983, Ser. No. 518,776

Int. Cl.³ C08F *4/44*

U.S. Cl. 526—129 **15 Claims**

1. The method of making polymers and interpolymers from polymerizable 1-olefins which comprises polymerizing at least one of said olefins under polymerizing conditions with a catalyst system comprising an alkyl or aryl aluminum compound cocatalyst and a catalyst prepared by:

(1) reacting a metal oxide support containing silica or alumina having surface hydroxyl groups or both with a functional organophosphorus compound which is a reactive towards said surface hydroxyl groups;

(2) reacting the product of (1) with a Group IIA organometallic compound, or Group IIA organometallic complex with alkyl aluminum, alkyl boron or alkyl zinc, or mixtures; and

(3) reacting the product of (2) with a Group IVB, VB or VIB metal halide, alkoxy-halide, alkoxide or mixtures of these, or reacting the product of (1) with a Group IVB, VB or VIB metal halide, alkoxy-halide or alkoxide or mixtures and then with a Group IIA organometallic compound, or Group IIA organometallic complex with alkyl aluminum, alkyl boron or alkyl zinc, or mixtures.

4,510,300

PERFLUOROCARBON COPOLYMER FILMS

Stanley B. Levy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 366,660, Apr. 8, 1982, abandoned. This application Mar. 3, 1983, Ser. No. 469,899

Int. Cl.³ C08F *14/26*

U.S. Cl. 526—247 **39 Claims**

1. A film of a melt fabricable perfluorocarbon copolymer, having a shrinkage of 0 to 10 percent in a first direction in the plane of the film, and a shrinkage of at least 20 percent in a second direction in the same plane as the first and which is perpendicular to the first direction when heated for two minutes at about 50° C. below the crystalline melting point of the polymer.

4,510,301

FLUOROCARBON COPOLYMER FILMS

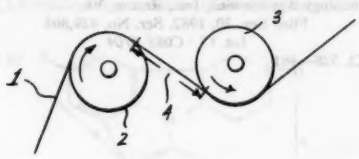
Stanley B. Levy, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 383,454, Jun. 1, 1982, abandoned. This application Apr. 25, 1983, Ser. No. 485,821

Int. Cl.³ C08F *10/02*

U.S. Cl. 526—254 **20 Claims**

1. A film of a melt fabricable fluorocarbon copolymer of 40 to 60 mole percent ethylene copolymerized with tetrafluoroethylene or chlorotrifluoroethylene, and optionally a minor amount of at least one other copolymerizable monomer; said film when heated for two minutes at 200° C. having a shrinkage of 0 to 10 percent in a first direction in the plane of the film, and a shrinkage of at least 5 percent in a second direction in the



same plane as the first and which is perpendicular to the first direction.

4,510,302

FORMULATIONS AND THEIR USE FOR PIGMENTING AND/OR DELUSTRING DRESSING AGENTS FOR LEATHER AND LEATHER IMITATIONS

Günter Kolb, deceased, late of Leverkusen (by Ingeborg Kolb, heiress); Leo Tork, Leverkusen, and Wolfgang Höhne, Bergisch-Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jan. 18, 1983, Ser. No. 459,006

Claims priority, application Fed. Rep. of Germany, Feb. 4, 1982, 3203817

Int. Cl.³ C08F *220/12, 226/10*

U.S. Cl. 526—264 **4 Claims**

1. A composition comprising a pigment or delustrant and a binder therefore which binder is a copolymer having an intrinsic viscosity (η) of 0.05–0.35 which copolymer is prepared by copolymerizing the following components:

10–40% by weight of an acrylic acid ester having 1–12 C atoms in the alcohol chain,

10–40% by weight of a methacrylic acid ester having 1–4 C atoms in the alcohol chain,

10–30% by weight of N-vinylpyrrolidone,

5–15% by weight of acrylic acid and

10–20% by weight of a vinyl ester having 1–4 C atoms in the acid chain,

in an organic solvent which is miscible with water in the presence of a per-compound or an azo compound which donates free radicals at the polymerization temperature.

4,510,303

ETHYLENE-ALPHA-OLEFIN-POLYENE RANDOM COPOLYMER RUBBER

Hidekuni Oda, Iwakuni; Syuji Minami, Otake; Hiroshi Inoue, Iwakuni; Akira Matsuda, and Yohzoh Yamamoto, both of Ichihara, all of Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 6, 1983, Ser. No. 492,244

Claims priority, application Japan, May 6, 1982, 57-74613

Int. Cl.³ C08F *210/18*

U.S. Cl. 526—282 **7 Claims**

1. Ethylene-alpha-olefin-polyene random copolymer rubber comprising ethylene, an alpha-olefin having 3 to 10 carbon atoms, and a polyene, wherein:

(A) a molar ratio of ethylene/alpha-olefin is 55/45 to 95/5;

(B) the polyene is a mixture of 5-ethylidene-2-norbornene (ENB) and 5-vinyl-2-norbornene (VNB) in a molar ratio of ENB/VNB of 1/1 to 20/1;

(C) an iodine value of the copolymer rubber is 2 to 40;

(D) an intrinsic viscosity [η] of the copolymer rubber is 1.0 to 6.0 dl/g measured in decalin at 135° C.; and

(E) g_η^* defined by a ratio of the intrinsic viscosity [η] to an intrinsic viscosity [η]l of a linear ethylene-propylene random copolymer having an ethylene content of 70 mole % and the same weight-average molecular weight determined by a light-scattering method as that of the copolymer rubber is 0.2 to 0.8.

4,510,304

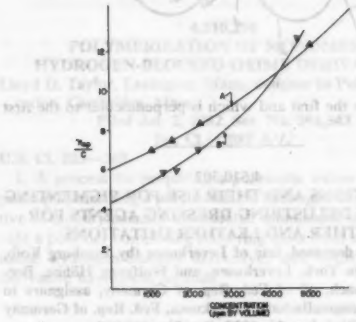
POLYMER FRACTIONATION

Albert F. Hadermann, Ijamsville, Md., assignor to General Technology Applications, Inc., Reston, Va.

Filed Sep. 30, 1982, Ser. No. 429,804

Int. Cl.³ C08F 6/04

U.S. Cl. 528—481 **10 Claims**



1. A method for obtaining a high molecular weight fraction of a hydrocarbon soluble, rubbery, thermoplastic polymer which comprises:

cryogenically comminuting said polymer to obtain discrete particles displaying a high surface energy state;

admixing said polymer particles while still in said high energy state with a liquid of adjusted solvent power toward said polymer so as to obtain upon admixing said polymer with the liquid a high molecular weight, polymer-rich coacervate fraction and a lower molecular weight polymer solution; and

separating said coacervate fraction from said polymer solution.

4,510,305

PROCESS FOR THE PRODUCTION OF POLYPROPYLENE POWDERS

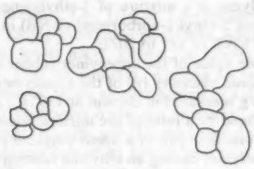
Hans H. Körsgen, Praroman-le Mouret, and Wolfgang Weller, Bulle, both of Switzerland, assignors to Coathylene S.A., Fribourg, Switzerland

Continuation of Ser. No. 369,295, Apr. 16, 1982, abandoned, which is a continuation of Ser. No. 157,700, Jun. 9, 1980, abandoned, which is a continuation of Ser. No. 957,946, Nov. 6, 1968, abandoned, which is a continuation of Ser. No. 801,449, May 27, 1977, abandoned, which is a continuation of Ser. No. 682,547, May 3, 1976, abandoned, which is a continuation of Ser. No. 523,284, Nov. 13, 1974, abandoned, which is a continuation of Ser. No. 446,884, Feb. 28, 1974, abandoned, which is a continuation of Ser. No. 777,565, Nov. 21, 1968, abandoned. This application Dec. 22, 1983, Ser. No. 564,655

Claims priority, application Austria, Nov. 21, 1967, 10518/67

Int. Cl.³ C08F 6/00; C08G 00/00; C08J 3/00

U.S. Cl. 528—494 **14 Claims**



1. A process for the production of finely divided polypropylene powders of grain size below 100μ which comprises the following steps:

(a) dissolving polypropylene in a single liquid phase consisting of 45 to 95 parts of weight of perchlorethylene and 55 to 5 parts by weight of non-solvent of the polypropylene, said non-solvent being the methyl half ether of ethylene glycol, at a temperature above 115° C., employing a sufficient amount of said single phase liquid to completely dissolve said polypropylene and up to 20 liters of said single phase liquid per kg of polypropylene;

(b) cooling this solution or allowing it to cool, under quiescent conditions, to a temperature below about 80° C. so that the polypropylene precipitates in the form of agglomerates of preformed individual particles of polypropylenes;

(c) separating the precipitated polypropylene from the liquid phase and drying it; and

(d) subjecting the dried polypropylene to mechanical comminution,

said polypropylene being high molecular weight polypropylene as is produced with Ziegler catalyst, said high molecular weight polypropylene being one which during precipitation from solvents or a mixture of solvents and non-solvents is obtained as a non-pulverulous lumpy mass.

4,510,306

METHOD FOR PURIFYING REACTION PRODUCTS CONTAINING HIGHER-ALKYL GLYCOSIDES

William K. Langdon, Grosse Ile, Mich., assignor to BASF Wyandotte Corporation, Wyandotte, Mich.

Continuation-in-part of Ser. No. 327,341, Dec. 4, 1981, abandoned. This application Sep. 13, 1983, Ser. No. 531,927

Int. Cl.³ C07H 1/06, 15/04

U.S. Cl. 536—127 **2 Claims**

1. A process for purifying crude higher-alkyl glycosides containing residual free higher alcohols, said glycosides obtained by the acid catalyzed reaction of C_8–C_{18} aliphatic monohydric alcohols with a source of monosaccharide, which comprises partially distilling a mixture of the crude higher-alkyl glycoside and a hydroxyl containing solvent selected from the group consisting of:

(a) glycerol,

(b) polyoxyalkylene glycols having an average of 3 to about 5 oxyalkylene units selected from oxyethylene and oxypropylene,

(c) C_1–C_4 alkyl ethers of polyoxyalkylene glycols having about 2 to about 5 oxyalkylene units selected from oxyethylene and oxypropylene, and

(d) C_1–C_4 alkyl ethers of aliphatic diols, triols, and tetrols having no more than 4 carbon atoms,

wherein further, the boiling point of the solvent is at least 10° C. higher than that of the higher alcohol used in the preparation of the higher-alkyl glycoside.

4,510,307

6-QUINAZOLINESULFONYL DERIVATIVES AND PROCESS FOR PREPARATION THEREOF

Hiroyoshi Hidaka, Tsu; Takanori Sone, Nobeoka; Yasuharu Sasaki, Nobeoka; Taisuke Sugihara, Nobeoka; Seiji Takagi, Nobeoka, and Kiyohide Sako, Nobeoka, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Japan

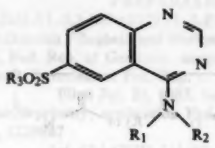
Filed Aug. 17, 1981, Ser. No. 293,192

Claims priority, application Japan, Aug. 20, 1980, 55-113401; Aug. 22, 1980, 55-114658; Jan. 29, 1981, 56-10847

Int. Cl.³ C07D 265/00, 247/00, 403/00

U.S. Cl. 544—283 **74 Claims**

1. A compound of Formula (I):



(I)

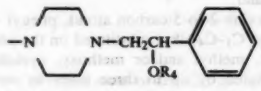
wherein

R_1 is a hydrogen atom or a C_{1-12} alkyl group;

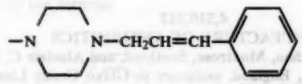
R_2 is a hydrogen atom, a C_{1-12} alkyl group, a C_{4-10} cycloalkyl group, an aryl group or an aralkyl group; and

R_1 and R_2 may be linked directly or through an oxygen atom to form a 5- to 7-membered heterocyclic ring together with the adjacent nitrogen atom; and

R_3 is a



group wherein R_4 is a C_{1-8} alkyl group; a $-NH(CH_2)_nNH_2$ group wherein n is an integer of 2 to 10; or a



group;

and the pharmaceutically acceptable acid addition salt thereof.

4,510,308

PROCESS FOR PREPARING CARBOLINE DERIVATIVES

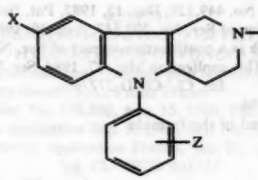
Willard M. Welch, Jr., Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Dec. 17, 1981, Ser. No. 331,494

Int. Cl.³ C07D *471/04*

U.S. Cl. 546—85 **4 Claims**

1. A process for preparing a 2-substituted-5-aryl-1,2,3,4-tetrahydro-γ-carboline compound of the formula:

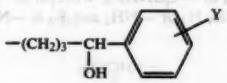


wherein

X is hydrogen, fluorine, chlorine or bromine;

Z is hydrogen, fluorine, chlorine or methoxy; and

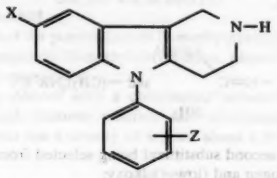
R is of the formula



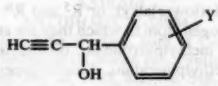
wherein

Y is hydrogen, methyl, fluorine or chlorine, which comprises

(a) contacting a corresponding 2-unsubstituted-5-aryl-1,2,3,4-tetrahydro-γ-carboline of the formula



wherein X and Z are each as previously defined, in a reaction-inert polar organic solvent with at least an equimolar amount of an acetylenic compound of the formula



wherein Y is as aforesaid, in the presence of an equimolar amount of formaldehyde with respect to said acetylenic compound and in the presence of a catalytically-effective amount of cuprous chloride or cuprous bromide at a temperature that is in the range of from about 20° C. up to about 100° C. until the condensation reaction to form the desired unsaturated intermediate product is substantially complete; and thereafter

(b) contacting the acetylenic condensation product formed in step (a) in a reaction-inert organic solvent with hydrogen at a pressure of up to about 75 p.s.i.g. in the presence of a catalytically-effective amount of a noble metal catalyst and at a temperature that is in the range of from about 15° C. up to about 75° C. until the reduction reaction to form the desired final product is substantially complete.

4,510,309

HISTAMINE H_2-ANTAGONISTS

Ronnie R. Crenshaw, Dewitt, and Aldo A. Algieri, Fayetteville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Continuation-in-part of Ser. No. 240,034, Mar. 3, 1981, Pat. No. 4,394,508, which is a continuation-in-part of Ser. No. 163,831, Jul. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 117,182, Jan. 31, 1980, abandoned, which is a continuation-in-part of Ser. No. 72,517, Sep. 4, 1979, abandoned.

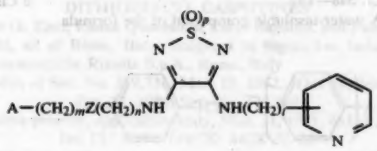
This application May 19, 1983, Ser. No. 496,169

The portion of the term of this patent subsequent to Jul. 19, 2000, has been disclaimed.

Int. Cl.³ C07D *417/12, 417/14*

U.S. Cl. 546—194 **25 Claims**

1. A compound of the formula



wherein

p is 1 or 2;

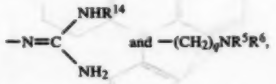
m is an integer of from zero to 2, inclusive;

n is an integer of from 2 to 4, inclusive;

t is 1 or 2;

Z is sulfur, oxygen or methylene;

A is phenyl, imidazolyl, thiazolyl, isothiazolyl, oxazolyl, isoxazolyl, triazolyl, thiadiazolyl, oxadiazolyl, furyl, thienyl or pyridyl; provided that A may contain one or two substituents, the first substituent being selected from (lower)alkyl,



and the second substituent being selected from (lower)alkyl, halogen and (lower)alkoxy;

q is an integer of from 0 to 6, inclusive; R^{14} is hydrogen, (lower)alkyl, (lower)alkanoyl or benzoyl; and

R^5 and R^6 each are independently hydrogen, (lower)alkyl, (lower)alkenyl, (lower)alkynyl, (lower)alkoxy(lower)alkyl or cyclo(lower)alkyl, provided that R^5 and R^6 may not both be cyclo(lower)alkyl; or R^5 and R^6, taken together with the nitrogen atom to which they are attached, may be pyrrolidino, methylpyrrolidino, dimethylpyrrolidino, piperidino, methylpiperidino, dimethylpiperidino, hydroxypiperidino, homopiperidino, heptamethyleneimino or octamethyleneimino;

or a nontoxic, pharmaceutically acceptable salt, hydrate or solvate thereof.

4,510,310

1,4-DIHYDRO-2,6-DIMETHYL-4-(2'-CHLOROPHENYL)-3,5-DICARBOXYLIC ACID,METHYL OR ETHYL,TRIFLUOROETHYL ESTER

Egbert Wehinger, Velbert; Horst Meyer; Friedrich Bossert, both of Wuppertal; Wulf Vater, Leverkusen; Robertson Towart, Wuppertal; Kurt Stoepel, Wuppertal, and Stanislav Kazda, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 181,453, Aug. 25, 1980, abandoned.

This application Sep. 30, 1982, Ser. No. 429,732

Claims priority, application Fed. Rep. of Germany, Sep. 1, 1979, 2935451

Int. Cl.³ C07D *213/55, 211/90;* A61K *31/44*

U.S. Cl. 546—321 **2 Claims**

1. The compound, which is 1,4-dihydro-2,6-dimethyl-4-(2'-chlorophenyl)-pyridine-3,5-dicarboxylic acid, methyl, 2,2,2-trifluoroethyl ester.

4,510,311

WATER-INSOLUBLE AZOLYSTYRYL OPTICAL BRIGHTENERS

Udo Eckstein, Cologne, Fed. Rep. of Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

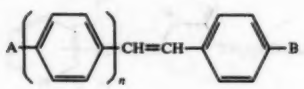
Filed Jan. 14, 1983, Ser. No. 458,085

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1982, 3203058

Int. Cl.³ C07D *451/00, 217/00, 213/08, 253/00*

U.S. Cl. 548—132 **8 Claims**

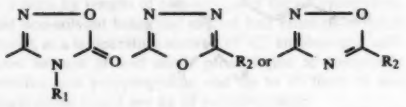
1. A water-insoluble compound of the formula



wherein

A is an oxazole, imidazole, 1,2,4-oxadiazole, 1,3,4-oxadiazole, 1,3,4-thiadiazole, 1,2,3-, 1,2,4- and 1,3,4-triazole, pyrimidine, 1,3,5-triazine, benzoxazole, benzothiazole, benzimidazole, naphthoxazole, benzo-s-triazole, naphtho-s-triazole, benzo(b)-furan, quinazoline, or quinoxaline radical,

B is



n is 1, 2 or 3,

R_1 is hydrogen, CN, R, —COR, SO_2R, COOR, CONHR or $CON(R')_2$,

R_2 is hydrogen, chlorine, bromine, —OR, —NHR, $—N(R')_2$ or NHCOR,

R' is alkyl having 1 to 6 carbon atoms and being optionally substituted by hydroxyl, C_1–C_4-alkoxy, CN, carboxyl, C_1–C_4-alkoxycarbonyl, $CONH_2$, chlorine or bromine, or trifluoromethyl, and

R is R'', alkenyl having 2 to 5 carbon atoms, phenyl —C_1–C_4-alkyl, phenyl C_1–C_4-alkyl substituted on the phenyl ring by chlorine, methyl and/or methoxy, cyclohexyl optionally substituted by up to three times by methyl and/or chlorine, or phenyl which is optionally substituted by C_1–C_4-alkyl, trifluoromethyl, chlorine, bromine, carboxyl, cyano, C_1–C_4-alkoxycarbonyl and/or C_1–C_4-alkoxy.

4,510,312

MANUFACTURE OF ANTIBIOTICS

William S. Strachan, Montrose, Scotland, and Alastair C. Brodie, Ickenham, England, assignors to Glaxo Group Limited, London, England

Filed Nov. 12, 1982, Ser. No. 441,249

Claims priority, application United Kingdom, Nov. 13, 1981, 8134359

Int. Cl.³ C07D *277/38*

U.S. Cl. 548—194 **8 Claims**

1. Crystalline ethyl (Z)-2-hydroxyimino-2-(2-triphenylmethylaminothiazol-4-yl)acetate hydrochloride N,N-dimethylformamide solvate.

4,510,313

2-GUANIDINO-4-HETEROARYLTHIAZOLES

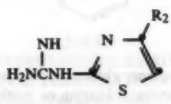
John L. LaMattina, Ledyard, and Christopher A. Lipinski, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 449,129, Dec. 13, 1982, Pat. No. 4,452,987, which is a division of Ser. No. 293,547, Aug. 20, 1981, Pat. No. 4,374,843, which is a continuation-in-part of Ser. No. 196,231, Oct. 14, 1980,. This application Mar. 27, 1984, Ser. No. 593,791

Int. Cl.³ C07D *277/48*

U.S. Cl. 548—194 **9 Claims**

1. A compound of the formula



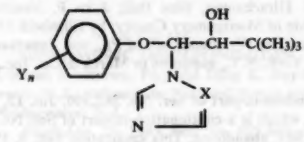
and the acid addition salts thereof, wherein R_2 is —$COCH(R'')R_3$ or —$CONHR_4$, wherein R'' is hydrogen or methyl, R_3 is halo, N_3 or $—NH_2$ and R_4 is $—NH_2$ or

4,510,314
PREPARATION OF 1-AZOLYL-3,3-DIMETHYL-1-PHENOXYBUTAN-2-OLS

Wolf-Dietrich Pflugbeil, and Wolfgang Krämer, both of Wuppertal, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 21, 1983, Ser. No. 516,171
Claims priority, application Fed. Rep. of Germany, Aug. 3, 1982, 3228867
Int. Cl.³ C07D *233/60, 249/08, 233/61*
U.S. Cl. 548—262 9 Claims

1. A process for the preparation of a 1-azolyl-3,3-dimethyl-1-phenoxybutan-2-ol of the formula



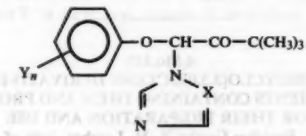
in which

X is a nitrogen atom or the CH group,

Y is halogen, alkyl, alkoxycarbonyl, nitro or phenyl which is optionally monosubstituted or disubstituted by fluorine, chlorine, bromine and/or methyl, and

n is 0,1,2 or 3,

comprising reacting a 1-azolyl-3,3-dimethyl-1-phenoxybutan-2-one of the formula



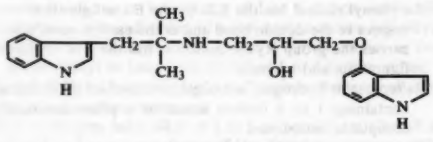
with an aluminum isopropylate or sec-butoxide under an excess pressure of about 1.5 to 5 bar in the presence of a diluent.

4,510,315
4[3-(1,1-DIMETHYL-2-3(3-INDOLYL)ETHYLAMINO)-2-HYDROXYPROPOXY]INDOLE

Henri Demarne, and Jean Wagnon, both of Montpellier, France, assignors to Sanofi, S.A., Paris, France

Division of Ser. No. 178,550, Aug. 15, 1980, Pat. No. 4,404,217. This application Sep. 9, 1983, Ser. No. 530,699
Claims priority, application France, Sep. 17, 1979, 70 20907
Int. Cl.³ C07D *403/12*
U.S. Cl. 548—455 2 Claims

1. A 4-[3-(1,1-dimethyl-2-(3-indolyl) ethylamino)-2-hydroxypropoxy] indole of formula



or a pharmaceutically acceptable acid addition salt thereof.

4,510,316
PURIFICATION OF N-METHYLPYRROLIDONE

James W. Cleary; Fred T. Sherk, and Afif M. Nesheiwat, all c/o Phillips Petroleum Company, Bartlesville, Okla. 74004

Filed Jun. 7, 1982, Ser. No. 385,756
Int. Cl.³ C07D *207/267*
U.S. Cl. 548—555 16 Claims

1. A method for purification of N-methylpyrrolidone from a mixture comprising N-methylpyrrolidone, phenol and water, said method comprising:

extracting phenol with a chlorinated aromatic extractant from said mixture; wherein said chlorinated aromatic extractant has a density of at least about 1.10 g/cm³.

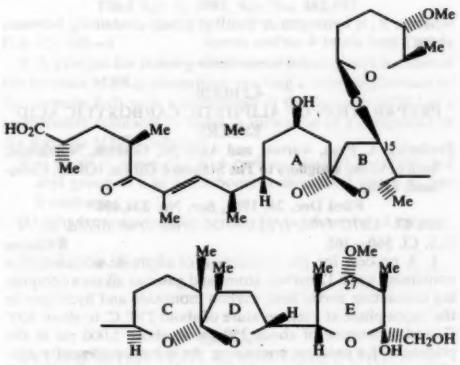
4,510,317
ANTIBIOTIC X-14934A

Chao-Min Liu, and John Westley, both of Cedar Grove, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Jul. 28, 1983, Ser. No. 518,233
Int. Cl.³ C07D *309/10*
U.S. Cl. 549—343 2 Claims

1. A compound of the formula

I



and the pharmaceutically acceptable salts thereof.

4,510,318
DITHIODIACYL CARNITINES

Maria O. Tinti; Emma Quaresima; Carlo Bagolini, and Paolo de Witt, all of Rome, Italy, assignors to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A., Rome, Italy

Division of Ser. No. 359,732, Mar. 19, 1982,. This application Jan. 12, 1984, Ser. No. 570,190
Claims priority, application Italy, Mar. 31, 1981, 48167 A/81
Int. Cl.³ C07C *149/20;* A61K *31/22*
U.S. Cl. 560—147 1 Claim

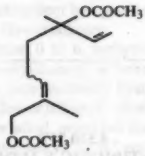
1. Dithio diacyl carnitines selected from the group consisting of 3,3′-dithiodipropionyl L-carnitine, 3,3′-dithiodipropionyl L-dicarnitine, 3,3′-dithiodibutyryl dicarnitine, 4,4′-dithiodibutyryl L-carnitine and 4,4′-dithiodibutyryl L-dicarnitine and the hydrochloride salts thereof.

4,510,319
FUNCTIONALIZATION OF TERMINAL TRISUBSTITUTED ALKENES AND DERIVATIVES THEREOF

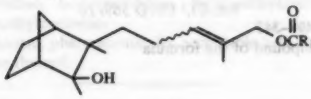
Brian J. Willis, Ramsey, N.J.; Robert G. Eilerman, Merrick, N.Y.; Philip A. Christenson, Midland Park, and John M. Yurecko, Jr., Bayonne, both of N.J., assignors to Fritzsche Dodge & Olcott Inc., New York, N.Y.

Filed Jul. 1, 1982, Ser. No. 394,139
Int. Cl.³ C07C 69/02, 67/02
U.S. Cl. 560—231 5 Claims

1. A compound having the structure:



4. A compound having the structure:



wherein R_1 is hydrogen or an alkyl group containing between about 1 and about 4 carbon atoms.

4,510,320
PREPARATION OF ALIPHATIC CARBOXYLIC ACID ESTERS

Frederick A. Pesa, Aurora, and Anne M. Graham, Northfield, both of Ohio, assignors to The Standard Oil Co. (Ohio), Cleveland, Ohio

Filed Dec. 24, 1981, Ser. No. 334,484
Int. Cl.³ C07C 1/06, 1/253, 9/04, 9/06, 9/08, 67/36, 69/14
U.S. Cl. 560—265 8 Claims

1. A process for the production of aliphatic acetate esters containing up to 12 carbon atoms and gaseous alkanes comprising contacting acetic acid, carbon monoxide and hydrogen in the vapor phase at a temperature of about 250° C. to about 400° C. and a pressure of about 250 psi to about 5,000 psi in the presence of a catalyst containing the mixed oxides of ruthenium, nickel, an alkali metal selected from Na, Li, K, Rb and Cs, and optionally a promoter metal selected from cobalt, cadmium, zinc, or mixtures thereof.

4,510,321
AUTOXIDATIVE CLEAVAGE OF KETONES IN THE PRESENCE OF PULVERIZED ALKALI METAL HYDROXIDE

Divakaran Masilamani, Morristown, and Edward H. Manahan, Morris Plains, both of N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Jan. 31, 1983, Ser. No. 462,295
Int. Cl.³ C07C 27/00, 45/33, 51/245, 51/255
U.S. Cl. 562—421 18 Claims

1. A process for autoxidation of a C_4–C_{10} cycloalkanone having at least one hydrogen on a carbon alpha to the carbonyl carbon which comprises contacting, under nonhomogeneous conditions, a liquid phase comprising said C_4–C_{10} cycloalkanone and an aprotic ether with elemental oxygen gas in the presence of a pulverized alkali metal hydroxide at a temperature of no more than about 50° C. for a time sufficient to cleave the bond between the alpha carbon and the carbonyl carbon to produce a reaction mixture of an insoluble alkali metal salt of an oxidized product, substantially free of further oxidation products, the alkali metal salt of the oxidized product being selected from an alkali metal salt of a keto-alkanoic acid, a dialkali metal salt of a dicarboxylic acid, or an alkali metal salt of a benzoate and a liquid phase comprising the the aprotic ether and said C_4–C_{10} cycloalkanone, separating the reaction mixture into the insoluble alkali metal salt of the oxidized product and said liquid phase, and recovering the alkali metal salt of the oxidized product.

4,510,322
INDACRINONE HAVING ENHANCED URICOSURIC

Edward H. Blaine, Chalfont; Edward J. Cragoe, Jr., Lansdale; Ralph F. Hirschmann, Blue Bell; John F. Nancarrow, deceased, late of Montgomery County; by Elisabeth M. Nancarrow, executrix, Wyndmoor, all of Pa., and Jonathan A. Tobert, New York, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 282,360, Jul. 13, 1981, abandoned, which is a continuation-in-part of Ser. No. 244,508, Mar. 16, 1981, abandoned. This application Feb. 3, 1983, Ser. No. 463,685
Int. Cl.³ C07C 59/80
U.S. Cl. 514—255 13 Claims

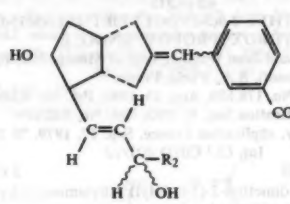
1. A composition of matter comprising, in combination:
(a) the (+) enantiomer of indacrinone; and
(b) the (−) enantiomer of indacrinone;
wherein the weight ratio of (a):(b) is from about 8:1 to 10:1, that is, the (+) enantiomer is from 89% to 91% by weight of the total, and the (−) enantiomer is from 11% to 9% by weight of the total weight of indacrinone.

4,510,323
CIS-BICYCLO[3.3.0]OCTANE DERIVATIVES, MEDICAMENTS CONTAINING THEM AND PROCESSES FOR THEIR PREPARATION AND USE

Horst R. E. Boehlke; Gerriet K. H. Loschen, both of Stolberg; Gudrun E. Michel, Aachen, and Bernd Müller, Roetgen, all of Fed. Rep. of Germany, assignors to Gruenenthal GmbH, Stolberg, Fed. Rep. of Germany

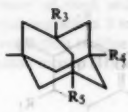
Filed Nov. 17, 1982, Ser. No. 442,240
Claims priority, application Fed. Rep. of Germany, Nov. 21, 1981, 3146278
Int. Cl.³ C07C 69/76, 65/24
U.S. Cl. 514—530 25 Claims

1. Cis-bicyclo[3.3.0]octane derivatives corresponding to the formula:



(I)

wherein
the phenyl radical has the EZ- or the E-configuration with respect to the double bond and at the carbon atom which carries the group R_2 the molecule has the RS- or S-configuration, and wherein
R_1 represents hydrogen, a straight or branched alkyl radical containing 1 to 4 carbon atoms or a pharmaceutically acceptable cation, and
R_2 represents cyclohexyl, 4-methylcyclohexyl or an 1-adamantyl group having the structure



wherein R_3, R_4 and R_5 have the same or a different meaning and each represents hydrogen or methyl.

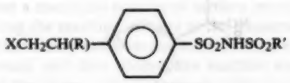
4,510,324

MONOMERIC DISULFONIMIDES

Robert D. Rossi, Levittown, Pa., and Dilip K. Ray-Chaudhuri, Bridgewater, N.J., assignors to National Starch and Chemical Corp., Bridgewater, N.J.

Filed Apr. 28, 1983, Ser. No. 489,665
Int. Cl.³ C07C *143/78*
U.S. Cl. 564—82 **4 Claims**

1. A compound of the formula:



wherein X is bromine, chlorine, or iodine, R is hydrogen or methyl and R′ is alkyl, aryl, toluene or mesitylene.

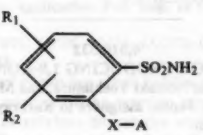
4,510,325

PHENYL SULFONAMIDES

Willy Meyer, Riehen, and Werner Füry, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 282,847, Jul. 13, 1981, abandoned. This application Sep. 13, 1982, Ser. No. 417,743
Claims priority, application Switzerland, Jul. 17, 1980, 5481/80; Nov. 5, 1980, 8216/80; Jun. 17, 1981, 3991/81
Int. Cl.³ C07C *143/78*
U.S. Cl. 564—89 **12 Claims**

1. A compound of the formula:



wherein

X is —O—, —S—, —SO— or —SO_2—; and

A is alkenyl of 2 to 6 carbon atoms; haloalkenyl of 2 to 6 carbon atoms; or alkyl of 1 to 6 carbon atoms substituted with (i) alkoxy or haloalkoxy of 1 to 4 carbon atoms; (ii) alkylthio or haloalkylthio of 1 to 4 carbon atoms; (iii) alkylsulfinyl or haloalkylsulfinyl of 1 to 4 carbon atoms; or (iv) alkylsulfonyl or haloalkylsulfonyl of 1 to 4 carbon atoms;

R_1 is hydrogen; halo; alkyl of 1 to 5 carbon atoms; or alkenyl of 2 to 5 carbon atoms; and

R_2 is hydrogen; halo; alkyl of 1 to 5 carbon atoms; alkenyl of 2 to 5 carbon atoms; alkoxy of 1 to 5 carbon atoms or carbalkoxy wherein alkoxy contains 1 to 5 carbon atoms.

4,510,326

PROCESS FOR THE PREPARATION OF FORMYLALKANOLAMINES

Clifford L. Lambert, Jr., and Roger G. Duranleau, both of Georgetown, Tex., assignors to Texaco Inc., White Plains, N.Y.

Filed Jul. 18, 1983, Ser. No. 514,712
Int. Cl.³ C07C *102/00*
U.S. Cl. 564—132 **9 Claims**

1. A process for the preparation of a formylalkanolamine which comprises reacting carbon monoxide with an alkanolamine at a temperature ranging from about 60° to 300° C. and a pressure ranging from about 100 to 10,000 psig, said alkanolamine being represented by the formula:

$$RNH_x—(CH_2—(X)_z—CH_2—OH)_y$$

in which x is 0 or 1, R is hydrogen, a methyl, or an aminoethyl radical with the proviso that R is hydrogen when x is 0, y is 1 or 2 and the sum of x and y is 2, X is a divalent radical from the group consisting of —CH_2— and —CHOH—, and z is 0 or 1.

4,510,327

PROCESS FOR MAKING ALKALI-METAL TETRAORGANYLBORATES

William G. Peet, Elkton, Md., and Frederick N. Tebbe, Hockessin, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 6, 1983, Ser. No. 482,597
Int. Cl.³ C07F *5/02*
U.S. Cl. 568—1 **18 Claims**

1. A process for making alkali-metal tetraorganyl borates of the formula MBR_4, comprising reacting a triorganylborane of the formula R_3B with a compound of the formula MOR^1 at a temperature sufficient to result in formation of a compound of the formula MBR_4, wherein

R is an alkyl group of 1 to 6 carbons, an aryl or substituted aryl group of 6 to 12 carbons, or an aralkyl group of 7 to 9 carbons;

R^1 is hydrogen or an alkyl group having from 1 to 6 carbons; and

M is Li, Na, K or Cs.

4,510,328

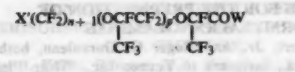
FLUORINATED VINYL ETHER COMPOUNDS AND PROCESS FOR PRODUCING THE SAME

Kyoji Kimoto, Kanagawa; Hirotsugu Miyauchi, Tokyo; Jukichi Ohmura, Kanagawa; Mikio Ebisawa, Kanagawa, and Toshioki Hane, Kanagawa, all of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 152,847, May 23, 1980, Pat. No. 4,329,434. This application Sep. 3, 1981, Ser. No. 299,164
Claims priority, application Japan, May 31, 1979, 54-67888; May 31, 1979, 54-67889; Jul. 9, 1979, 54-85852; Jul. 18, 1979, 54-90301; Jul. 18, 1979, 54-90302
Int. Cl.³ C07C *43/16*
U.S. Cl. 568—32 **6 Claims**

1. A process for producing a fluorinated vinyl ether compound having the formula

$$X'(CF_2)_{n+1}(OCFCF_2)_{p'}OCF=CF_2$$
$$\quad\quad\quad



wherein X', n and p' have the same meanings as defined above and wherein W is F or OM', M' being an alkali metal, to pyrolysis at a temperature of from 100° to 600° C.

4,510,329

PROCESS FOR PREPARING CYCLOPENTENOLONES

Kenji Saito, Toyonaka, and Hiroshi Yamachika, Ibaraki, both of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

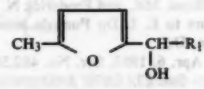
Filed Nov. 28, 1980, Ser. No. 211,225

Claims priority, application Japan, Dec. 7, 1979, 54-159454; May 26, 1980, 55-70456; Jul. 11, 1980, 55-95368

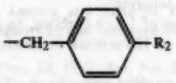
Int. Cl.³ C07C *45/59*

U.S. Cl. 568—310 **5 Claims**

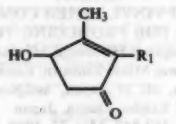
1. A one-step process for preparing a cyclopentenolone which consists essentially of treating a furan-carbinol of the formula:



wherein R_1 is an alkyl group having not more than 6 carbon atoms, an alkenyl or alkynyl group having not more than 6 carbon atoms or a group of the formula:



in which R_2 is a hydrogen atom, a methyl group or a halogen atom at a temperature of 120° to 200° C. in an aqueous medium at a pH of 3 to 8 in the presence or absence of a catalyst to obtain the corresponding cyclopentenolone of the formula:



wherein R_1 is as defined above.

4,510,330

PROCESS FOR THE PREPARATION OF δ-ETHYLENIC CARBONYL COMPOUNDS

Norbert Bluthé, Villeurbanne; Jacques Goré, Caluire, and Max Malacria, Villeurbanne, all of France, assignors to Rhone-Poulenc Sante, Courbevoie, France

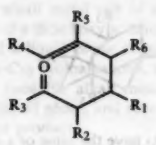
Filed Jun. 21, 1982, Ser. No. 390,700

Claims priority, application France, Jun. 23, 1981, 81 12301

Int. Cl.³ C07C *45/51*

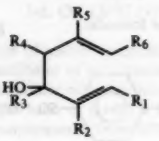
U.S. Cl. 568—403 **8 Claims**

1. A process for the preparation of δ-ethylenic carbonyl compounds of the general formula:



(I)

wherein R_1, R_4 and R_6 each represent a hydrogen atom or an acyclic radical containing 1 to 20 carbon atoms, the chain of which can contain one or more double or triple bonds, R_2 represents a hydrogen atom and R_3 and R_5 each represent an acyclic radical containing 1 to 20 carbon atoms, the chain of which can contain one or more double or triple bonds, or R_3 and R_4 together represent an alkylene radical $(—CH_2—)_n$ (wherein n represents an integer from 3 to 20 inclusive) in which one or more carbon atoms can optionally carry as substituent(s) one or more alkyl radicals containing 1 to 4 carbon atoms, by the rearrangement of a diethylenic alcohol of the general formula:



(II)

wherein R_1, R_2, R_3, R_4, R_5 and R_6 are as hereinbefore defined, which comprises carrying out the rearrangement at a temperature between −40° C. and the boiling point of the reaction mixture in the presence of a catalytic amount of a divalent palladium complex, and isolating the δ-ethylenic carbonyl product obtained.

4,510,331

PROCESSES FOR PRODUCING 7-OCTEN-1-AL AND DERIVATIVES THEREOF

Noriaki Yoshimura, and Masuhiko Tamura, both of Kurashiki, Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Jun. 22, 1982, Ser. No. 390,984

Int. Cl.³ C07C *45/67*

U.S. Cl. 568—450 **4 Claims**

1. A process for producing 7-octen-1-al which comprises isomerizing 2,7-octadiene-1-ol in the presence of a catalyst comprising oxides of at least two metals selected from the group consisting of copper, chromium and zinc at a reaction temperature of 100°-250° C.

4,510,332

PROCESS FOR PRODUCING 1,9-NONANEDIAL

Mitsuo Matsumoto; Noriaki Yoshimura, and Masuhiko Tamura, all of Kurashiki, Japan, assignors to Kuraray Company, Ltd., Kurashiki, Japan

Filed Feb. 25, 1983, Ser. No. 469,699

Claims priority, application Japan, Mar. 12, 1982, 57-39695

Int. Cl.³ C07C *45/50*

U.S. Cl. 568—454 **9 Claims**

1. A process for producing 1,9-nonanedial, which comprises the steps of:

(I) hydroformylating 7-octen-1-al with a mixture of hydrogen and carbon monoxide in an aqueous solution of sulfolane or 1,4-butanediol in which the weight ratio of sulfolane or 1,4-butanediol to water is 15/85 to 75/25, in the presence of (a) a rhodium complex and (b) the sodium, potassium or lithium salt of m-(diphenylphosphino)-benzenesulfonic acid at a temperature of 40° C. to 110° C.;

(II) extracting 1,9-nonanedial from the reaction mixture obtained in step (I) with a saturated aliphatic primary

alcohol containing about 5 to 11 carbon atoms or a mixture of said primary alcohol and a saturated aliphatic hydrocarbon containing about 5 to 10 carbon atoms; and

(III) recycling the extraction residue containing the catalyst components obtained in step (II) to the hydroformylation step (I).

4,510,333

METHOD FOR PREPARING POLY(TETRAMETHYLENE ETHER) GLYCOL HAVING NARROW MOLECULAR WEIGHT DISTRIBUTION

Gerfried Pruckmayr, Media, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Jun. 5, 1984, Ser. No. 617,607

Int. Cl.³ C07C *41/14*

U.S. Cl. 568—617 **5 Claims**

1. A method for preparing poly(tetramethylene ether)glycol having a molecular weight distribution of 1.1–1.4, the method comprising

(a) bringing tetrahydrofuran and a cationic initiator together

(1) in a mol ratio such that the degree of polymerization will be at about a minimum, and

(2) at a temperature which will promote generation of about a maximum number of tertiary oxonium ions;

(b) keeping the resulting mixture at the temperature in (a 2) until the tertiary oxonium ion concentration is at or near a maximum, and then cooling the reaction mass in (a) to within the range −25° C. through +25° C.;

(c) then adding enough THF to the reaction mass to allow the polymerization to proceed to the desired point;

(d) then holding the reaction mass within the range −25° C. through +25° C. until the desired molecular weight and MWD have been reached; and then

(e) quenching the polymerization.

4,510,334

METHOD OF PREPARING ALKALIHALIDE FREE OLIGOMERIC, BROMINOUS XYLYLENE BISPHENOL ETHERS

Dirk Glembin, St. Augustin; Kurt Huhn, Lohmar; Günter Meyer, Troisdorf-Sieglar, and Manfred Thallmeier, Troisdorf-Eschmar, all of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Apr. 15, 1983, Ser. No. 485,343

Claims priority, application Fed. Rep. of Germany, Apr. 17, 1982, 3214199

Int. Cl.³ C07C *41/36, 41/16, 43/275*; C08G *65/30*

U.S. Cl. 568—643 **4 Claims**

1. A method of removing alkali halides in a washing step from a reaction mixture of the reaction products of xylylene dichlorides and/or xylylene dibromides with bisphenols in the presence of alkaline compounds or alkali salts, at 85° to 160° C. and, in some cases, under addition of end-group blocking monophenols or monohalogen alkyl compounds, in the presence of ketones exhibiting a miscibility gap with water, comprising adding a ketone-water mixture to the reaction mixture wherein the ketone is of 3 to 10 carbon atoms, subjecting the reaction mixture to filtration to obtain a filtrate; separating the filtrate into a ketonous phase and an aqueous phase and separately evaporating and condensing each of the separated phases to form first and second condensates, combining the condensates to form the ketone-water mixture, using said ketone water mixture as washing media in the washing step, stirring the filter cake in the ketone water mixture and again filtering the resultant mixture.

4,510,335

PERFLUORINATED BRANCHED ETHER COMPOUNDS

Richard J. Lagow, 6204 Shadow Mountain, Austin, Tex. 78731, and Daniel F. Persico, 908 Hermitage Dr., Austin, Tex. 78753

Filed Mar. 29, 1982, Ser. No. 363,113

Int. Cl.³ C07C *43/12*; B01J *13/00*

U.S. Cl. 568—683 **5 Claims**

1. Perfluorinated bis-neopentyl ether.
2. Perfluorinated bis-isopropyl ether.
3. Perfluorinated bis-isobutyl ether.
4. Perfluorinated bis-isopentyl ether.
5. Perfluorinated bis-tertiary-butyl ether.

4,510,336

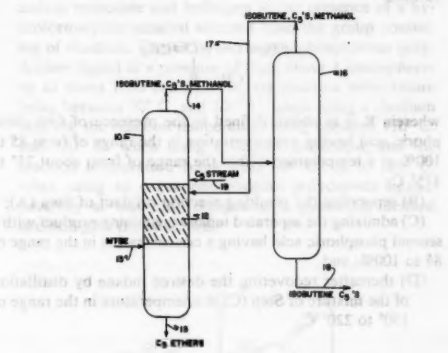
TRANSETHERIFICATION METHOD

Dennis Hearn, Houston, Tex., assignor to Chemical Research & Licensing Company, Houston, Tex.

Filed Oct. 20, 1982, Ser. No. 435,459

Int. Cl.³ C07C *41/14*

U.S. Cl. 568—697 **14 Claims**



1. A method of transetherification comprising concurrently:

(a) feeding a first ether capable of dissociating into a first olefin and an alcohol and having a boiling point at pressure in the range of 0 to 400 psig to a distillation column reactor,

(b) contacting said first ether with a fixed bed acidic cation exchange resin which is a distillation structure to thereby at least partially dissociate said first ether into an alcohol and first olefin,

(c) feeding a second olefin having 3 to 10 carbon atoms and a higher boiling point than said first olefin to said fixed bed, whereby said second olefin reacts with said alcohol to form a second ether having a higher boiling point than said first ether,

(d) fractionating the resultant second ether from unreacted materials,

(e) withdrawing said second ether from the distillation column reactor as a bottoms,

(f) withdrawing unreacted materials as an overhead.

4,510,337

PROCESS FOR PRODUCTION OF 1,1-DIMETHYL-6-HYDROXYINDANS

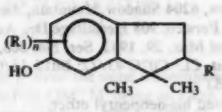
Raymond L. Cobb, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 31, 1984, Ser. No. 575,593

Int. Cl.³ C07C *39/12*

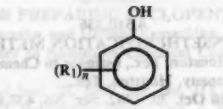
U.S. Cl. 568—734 **8 Claims**

1. A process for preparing compounds of the formula

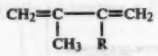


wherein R is a member selected from H and CH_3 and R_1 is a member selected from alkyl radicals containing up to 5 carbon atoms and n is 0 or an integer of 1 or 2 which comprises:

(A) reacting a phenol of the formula



wherein in R_1 and n are as above defined with a diene of the formula



wherein R is as above defined in the presence of first phosphoric acid having a concentration in the range of from 85 to 100% at a temperature within the range of from about 25° to 175° C.;

(B) separating the resulting reaction product of Step (A);

(C) admixing the separated indane containing product with a second phosphoric acid having a concentration in the range of 85 to 100%; and

(D) thereafter recovering the desired indane by distillation of the mixture of Step (C) at a temperature in the range of 150° to 220° C.

4,510,338

RESORCIN DERIVATIVES, PROCESS FOR THEIR PREPARATION AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Edit Toth; Jozsef Torley; Gyorgy Fekete; Laszlo Szporny; Laszlo Vereczkey; Eva Palosi; Imre Klebovich; Pal Vittay; Sandor Gorog, and Istvan Hajdu, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

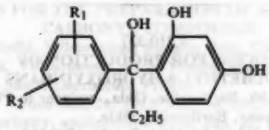
Filed Dec. 27, 1983, Ser. No. 565,839

Claims priority, application Hungary, Dec. 28, 1982, 4189/82

Int. Cl.³ C07C *39/11*

U.S. Cl. 568—766 **4 Claims**

1. A compound of the formula (I)



(I)

wherein R_1 and R_2 independently represent hydrogen, halogen, trihalomethyl, alkyl having from one to 3 carbon atoms or alkoxy having from one to 3 carbon atoms.

4,510,339

INCREASING CATALYST LIFETIME IN HYDROGENATION OF A CARBOHYDRATE IN AQUEOUS SOLUTION

Blaise J. Arena, Des Plaines, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 457,546, Jan. 12, 1983, abandoned. This application Jul. 9, 1984, Ser. No. 629,151

Int. Cl.³ C07C *29/136, 29/14, 31/18, 31/26*

U.S. Cl. 568—863 **9 Claims**

1. In the method of hydrogenating a feedstock containing a carbohydrate in aqueous solution to its polyols using a group VIII metal as a hydrogenation catalyst, the improvement wherein said feedstock immediately prior to contacting with catalyst under hydrogenation conditions contains less than about 0.5 ppm dissolved oxygen.

4,510,340

METHYL SUBSTITUTED PINYL OXOPENTENES, ORGANOLEPTIC USES THEREOF AND PROCESS FOR PREPARING SAME

Braja D. Mookherjee, Holmdel; Robert W. Trenkle, Bricktown; Robin K. Wolff, Point Pleasant; Richard M. Boden, Ocean, and Takao Yoshida, West Long Branch, all of N.J., assignors to International Flavors & Fragrances, Inc., New York, N.Y.

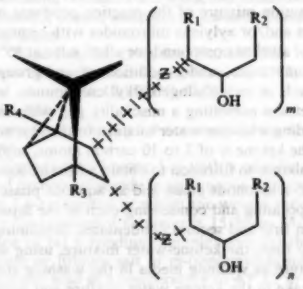
Division of Ser. No. 396,485, Jul. 8, 1982, Pat. No. 4,424,378, which is a continuation-in-part of Ser. No. 362,237, Mar. 26, 1982, Pat. No. 4,428,387. This application May 20, 1983, Ser. No. 496,651

Int. Cl.³ C07C *29/16, 27/04*

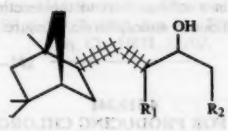
U.S. Cl. 568—884 **1 Claim**

GLC PROFILE FOR EXAMPLE II

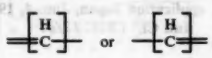
1. A mixture of compound containing at least one alcohol defined according to the structure:



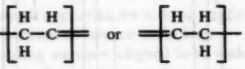
or defined according to the structure:



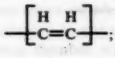
wherein in the mixture Z represents methylidene defined according to the structure:



or ethylidene defined according to the structure:



or ethylenyl defined according to the structure:



wherein one of the dashed lines represents a carbon-carbon single bond and the other of the dashed lines represents no bond; wherein n is 0 or 1 and m is 0 or 1 with the sum of n+m being equal to 1; wherein R_1, R_2, R_3 and R_4 represent hydrogen or methyl; wherein one of the lines:

++++

represents a carbon-carbon single bond and the other of the lines:

++++

represents a carbon-carbon single bond or a carbon-carbon double bond; wherein one of the lines:

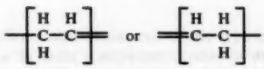
/+/+/+/+/+/

represents a carbon-carbon single bond and the other of the lines:

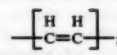
/+/+/+/+/

represents a carbon-carbon single bond or a carbon-carbon double bond; with the provisos that:

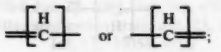
(i) when R_3 and R_4 are each hydrogen, the dashed line at the 7–5 position is a carbon-carbon single bond; n=0 and m is 1; Z represents ethylidene having the structure:



or ethylenyl having the structure:



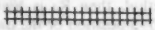
(ii) when one of R_3 or R_4 is methyl, then either the dashed line at the 7–5 position or the dashed line at the 7–4 position is a carbon-carbon single bond; and Z represents methylidene defined according to the structure:



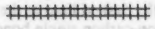
(iii) when R_3 is methyl, then n is 1 and m is 0 and R_4 is hydrogen; and

(iv) when R_4 is methyl, then R_3 is hydrogen, n is 0 and m is 1;

and wherein one of the lines:

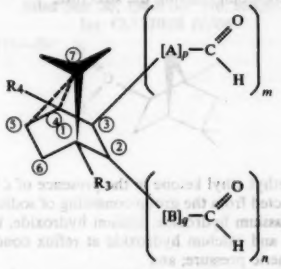


is a carbon-carbon double bond and the other of the lines:

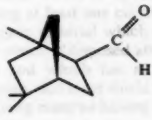


is a carbon-carbon single bond, produced according to the process comprising the steps of:

(1) reacting alpha pinene or beta pinene with a mixture of carbon monoxide and hydrogen in the presence of a hydroformalytion catalyst selected from the group consisting of rhodium, $Co_2(CO)_8$ and organophosphorous polydentate ligand at a pressure of from about 3 atmospheres up to about 1000 atmospheres, the reaction temperature being between 70° C. and 100° C. when using a rhodium catalyst; the reaction temperature being between 110° C. and 120° C. when using a $Co_2(CO)_8$ catalyst; and the reaction temperature being from 90° C. up to 120° C. when using an organophosphorous polydentate ligand; whereby at least one compound is produced, defined according to the structure:



or the compound having the structure:



wherein in the mixture one of the dashed lines at the 7–5 or 7–4 positions represents a carbon-carbon single bond and the other of the dashed lines at the 7–5 or 7–4 position represents no bond; wherein one of R_3 or R_4 represents hydrogen and the other of R_3 or R_4 represents hydrogen or methyl; wherein m=0 or 1 and n=0 or 1 with the sum of m+n being equal to 1; wherein A and B each represents a methylene defined according to the structure:

wherein p=0 or 1 and q=0 or 1 with the provisos that:

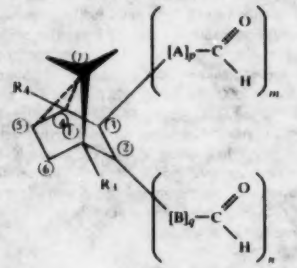
(i) when the dashed line at the 7–5 position is a carbon-carbon single bond, then R_3 and R_4 are both hydrogen, m is 0, n is 1 and q is 1;

(ii) when one of R_3 or R_4 is methyl and the other of R_3 or R_4 is hydrogen, then p and q are both 0;

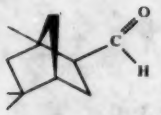
(iii) when R_3 is methyl, then R_4 is hydrogen and the dashed line at the 7–5 position or the dashed line at the 7–4 position is a carbon-carbon signel bond; and m is 0; n is 1 and q is 0;

(iv) when R_4 is methyla nd R_3 is hydrogen, then n is 0 and m is 1 and p is 0 and one of the dashed lines at the 7–5 position or the 7–4 position is a carbon-carbon single bond,

(2) reacting the compound having the structure:



or the compound having the structure:



with methyl ethyl ketone in the presence of a basic catalyst selected from the group consisting of sodium hydroxide, potassium hydroxide, lithium hydroxide, barium hydroxide and calcium hydroxide at reflux conditions and atmospheric pressure; and

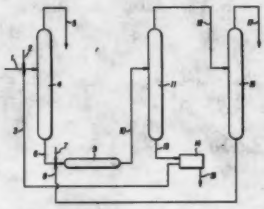
(3) reacting the resulting product with a reducing agent selected from the group consisting of alkali metal borohydrides and lithium aluminum hydride, the reaction being carried out in a solvent inert to the reaction mass under reflux conditions at atmosphereic pressure.

4,510,341

PROCESS FOR PRODUCING CHLOROPRENE

Itsuo Tabata, and Seiichi Watanabe, both of Ohmi, Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 7, 1980, Ser. No. 147,524
Claims priority, application Japan, Jun. 4, 1979, 54-69724
Int. Cl.³ C07C *17/34*
U.S. Cl. 570—229 **8 Claims**



1. A process for producing chloroprene which comprises a dehydrochlorination of 3,4-dichlorobutene-1 by contacting 3,4-dichlorobutene-1 with the sodium alkoxide of tetrahydrofurfuryl alcohol.

4,510,342

HIGH VISCOSITY INDEX SYNTHETIC OILS AND SYNTHESIS THEREOF

Janie K. Currie, Russell Township, Geauga County, and J. Robert Mooney, Chagrin Falls, both of Ohio, assignors to The Standard Oil Company, Cleveland, Ohio

Filed Dec. 29, 1982, Ser. No. 454,338
Int. Cl.³ C07C *3/02*
U.S. Cl. 585—524 **15 Claims**

1. A process for preparing high viscosity index synthetic oils from 1-olefins which comprises polymerizing a 1-olefin or mixture of 1-olefins in the presence of

(a) at least one transition metal halide catalyst,

(b) at least one alkyl aluminum compound containing up to about 15 carbon atoms in each alkyl group and up to about 40 carbon atoms per molecule as a co-catalyst, and

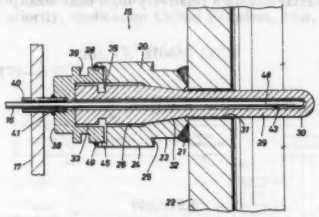
(c) a saturated alkyl fluoride.

4,510,343

THERMOWELL APPARATUS

Robert B. Sivyer, 1314 Beutel Dr., Houston, Tex. 77055

Filed Apr. 9, 1984, Ser. No. 598,052
Int. Cl.[3] H01L *35/02*
U.S. Cl. 136—242 9 Claims



1. A thermowell apparatus for sensing temperature in a flow pipe in a petrochemical furnace including,

a tubular housing member adapted to be welded to the outer wall of a pipe for use in a cracking furnace, said housing member having a bore aligned with an opening in the wall of a pipe, said bore in said housing member having a frusto-conical section.,

a tubular, closed end insert member having an outer frusto-conical surface adapted to engage the frusto-conical section of the housing member with the closed end of the insert member extended midway into a pipe;

a closure member adapted to close the open end of said housing member and enclose the insert member within said housing member; and

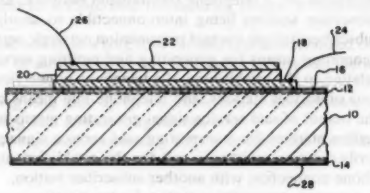
said closure member having a central opening for insertion of a thermocouple into the interior of the insert member and being removably welded to said housing member with a seal weld.

4,510,344

THIN FILM SOLAR CELL SUBSTRATE

Elliot Berman, Los Angeles, Calif., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Dec. 19, 1983, Ser. No. 562,942
Int. Cl.[3] H01L *31/06*
U.S. Cl. 136—256 2 Claims



1. In a photovoltaic solar cell of the type including a glass substrate, a tin oxide transparent conductor deposited on said substrate, a thin film semiconductor layer deposited on said transparent conductor, and a second conductor deposited on said semiconductor layer, the improvement comprising:

said glass substrate containing a substantial percentage of sodium oxide, which substrate has been chemically treated, on at least the surface selected to support the transparent conductor, to:

(a) replace sodium ions with potassium ions to a depth of about 100 microns and

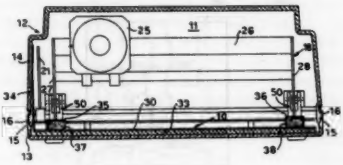
(b) thereafter, remove any remaining sodium ions from said surface to a depth of at least about 0.1 micron.

4,510,345

SCREEN FOR ELECTRICAL CIRCUITS

Armando Costa, Ivrea, and Federico Morbin, Candelo, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jul. 20, 1982, Ser. No. 400,113
Claims priority, application Italy, Jul. 23, 1981, 68022 A/81
Int. Cl.[3] H05K *9/00*
U.S. Cl. 174—35 R 9 Claims



1. An office machine comprising a casing of non-metallic material, a plurality of metal mechanical parts mounted into said casing, at least one electrical circuit mounted into said casing, and means for screening said electrical circuit, said screening means comprising a flexible sheet having a first layer of insulating material and a second layer of metallic material carried by said first layer of insulating material, said flexible sheet being interposed between said casing and said electrical circuit in such a manner that said electrical circuit is disposed between said plurality of metal mechanical parts and said flexible sheet.

4,510,346

SHIELDED CABLE

Talmage P. Bursh, Jr., Marietta, Ga.; Dean I. Davis; John T. Slominski, both of Omaha, Nebr., and Raymond K. Swartz, Lilburn, Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J. and AT&T Technologies, Inc., New York, N.Y.

Filed Sep. 30, 1983, Ser. No. 538,067
Int. Cl.[3] H01B *11/06*
U.S. Cl. 174—36 14 Claims

1. A shielded cable, which comprises:

a core comprising at least one conductor;

a layer of dielectric material which encloses said core;

an inner shield which is disposed about said layer of dielectric material and which has an unjoined, longitudinal overlapped seam, said inner shield being made of a suitable metallic shielding material having a relatively high electrical conductivity;

an outer shield which encloses and which engages said inner shield, said outer shield comprising a suitable metallic shielding material which has a relatively high electrical conductivity and having an unjoined, longitudinally overlapped seam which is diametrically opposed to said seam of said inner shield to insure substantially continuous shielding of said cable; and

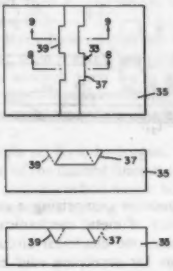
a jacket which is made of a plastic material and which encloses said outer shield.

4,510,347

FORMATION OF NARROW CONDUCTIVE PATHS ON A SUBSTRATE

Raymond E. Wiech, Jr., San Diego, Calif., assignor to Fine Particles Technology Corporation, Calif.

Filed Dec. 6, 1982, Ser. No. 447,159
Int. Cl.³ H05K 1/02
U.S. Cl. 174—68.5 **9 Claims**



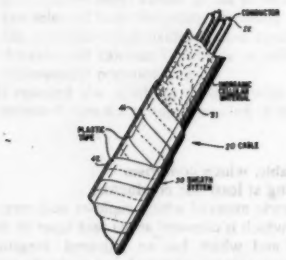
1. A ceramic substrate having paths thereon comprising:
(a) a molded unitary substrate having a surface and a molded continuous groove therein;
(b) said groove having substantially parallel opposing side walls and a bottom; and
(c) a predetermined opposing portion of the side walls forming the continuous groove extending from the bottom of the groove to the surface of the substrate at a different angle with respect to the bottom than other opposing portions of said side walls.

4,510,348

NON-SHIELDED, FIRE-RESISTANT PLENUM CABLE

Candido J. Arroyo, Lilburn; Nicholas J. Cogelia, Duluth, and Ralph J. Darsey, Lawrenceville, all of Ga., assignors to AT&T Technologies, Inc., Berkeley Heights and AT&T Bell Laboratories, Murray Hill, both of, N.J.

Filed Mar. 28, 1983, Ser. No. 479,249
Int. Cl.³ H01B 7/00
U.S. Cl. 174—121 A **14 Claims**



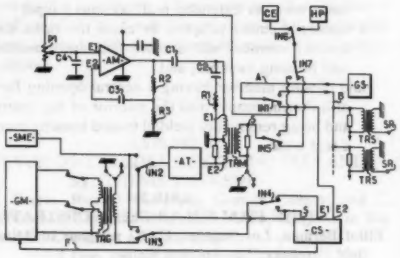
1. A cable which resists flame spread and smoke evolution, said cable comprising:
a core which includes at least one conductor enclosed in a plastic coating; and
a non-metallic sheath system having a relatively low thermal conductivity which encloses said core and which is effective to provide a predetermined time delay prior to thermal decomposition of the conductor coating when the cable is subjected to a relatively high temperature, said sheath system including:
a layer of an inorganic cellular material which encloses said core and which has a relativley low air permeability; and
a tape which is wrapped about said layer and which comprises a flame retardant thermosetting material, said sheath system in the vicinity of the interface between said layer of cellular material and said tape including a material having a relatively high heat absorptivity.

4,510,349

SYSTEM AND METHOD FOR TRANSMITTING MESSAGES TO A TELEPHONE SET THROUGH THE SUBSCRIBER'S LINE IN A TELEPHONE SYSTEM

Leonello Segre-Amar, 26, avenue de la Grande-Bretagne, Monte-Carlo, Monaco

Continuation-in-part of Ser. No. 452,072, Dec. 22, 1982, abandoned. This application Aug. 4, 1983, Ser. No. 520,246
Claims priority, application France, Dec. 30, 1981, 81 24542; Nov. 17, 1982, 82 19239; Jun. 29, 1983, 83 10782
Int. Cl.³ H04M 11/00
U.S. Cl. 179—2 A **30 Claims**

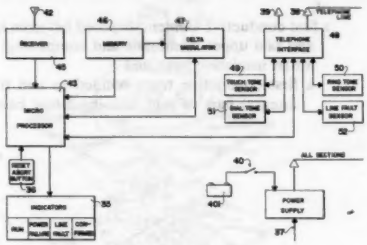


1. In a telephone system, comprising a plurality of subscriber stations each provided with a subscriber terminal including a telephone set, a telephone transmission network, each of said subscriber stations being interconnectible to another of said subscriber stations via said transmission network, service signal generating means for generating and emitting service signals relating to the establishing of a telephone connection between two subscriber stations, and telephone line means connecting the output of said service signal generating means to said subscriber stations for transmitting said service signals to a subscriber station emitting a call for the establishment of a telephone connection with another subscriber station,
a message transmitting system for transmitting messages to a subscriber station calling for the establishment of a telephone connection during the period of establishing said connection, said message transmitting system comprising message generator means for generating and emitting said messages, service signal transmitting circuit means, message transmitting circuit means, and a mixer having a first input connectible to said service signal generating means through said service signal transmitting circuit means and a second input connectible to said message generator means through said message transmitting circuit means, said mixer having an output connected to said telephone line means and said mixer, first and second inputs being simultaneously connectible to said service signal generating means and said message generator means.

4,510,350
PERSONAL ALARM APPARATUS INCLUDING WRIST SUPPORTED TRANSMITTER AND RECEIVER/TELEPHONE INTERFACE CIRCUIT

Peter Wagner, and Victor Shkawrytko, both of Winnipeg, Canada, assignors to Almicro Electronics Inc., Winnipeg, Canada

Filed Mar. 7, 1983, Ser. No. 472,759
Claims priority, application United Kingdom, Mar. 11, 1982, 8207192
Int. Cl.³ H04M *11/04*
U.S. Cl. 179—5 P 7 Claims



1. A personal alarm apparatus comprising an alarm signalling device having a casing and strap adapted for ready transport on the wrist of the person, a manually operable switch mounted on the casing and a transmitter responsive to operation of the switch for transmitting a radio frequency alarm signal, and a relay station mounted within a single housing and comprising means responsive to the alarm signal, interface means for connection to a telephone line, means for opening said line and dialling telephone numbers on said line, a memory, means for storing in said memory a plurality of telephone numbers with an order of priority whereby said dialling means can dial each of said numbers in turn, means for transmitting a repeated message on said line and means responsive to a signal on the line for ceasing said message, said interface means comprising;

means responsive to a dial tone on said line and arranged such that on detection of said dial tone said numbers are dialled and on failure to detect said dial tone said line is hung up and on three failures to so detect said dial tone said numbers are dialled,

means to detect an extension phone on said line off hook and arranged to actuate said transmitting means in response thereto,

means responsive to a ring tone on said line and arranged on receipt of a ring tone at any time subsequent to an alarm signal to actuate said transmitting means, and means for counting ring tone up to a predetermined number before actuating said transmitting means, and

means for repeatedly checking for a line fault and for indicating a fault when detected.

4,510,351
ACD MANAGEMENT INFORMATION SYSTEM

Peter E. Costello, Matawan; Lawrence D. Fossett, Morganville; Michael S. Lane, Colts Neck; Terrence T. Quin, Holmdel, and Nicholas K. Smith, Middletown, all of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

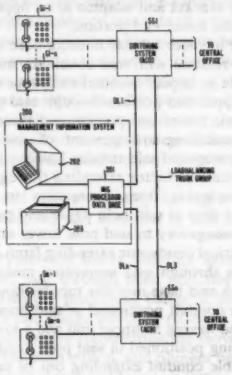
Filed Oct. 28, 1982, Ser. No. 437,433
Int. Cl.³ G06F *3/147*; H04M *3/50*; H04Q *3/64*
U.S. Cl. 179—27 D 15 Claims

1. A management information system (MIS) for use with an automatic call distribution (ACD) system having a plurality of attendant positions operable to answer incoming calls from a plurality of trunks, said MIS system comprising

a display,

means for continuously receiving from said ACD certain ACD data, said data corresponding to current call answering activity at said attendant positions,

means for comparing said data to previously received data to determine which data is to be displayed,



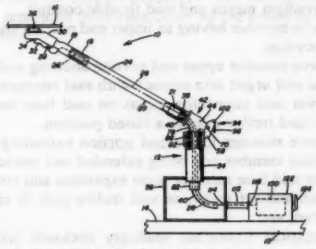
means for formatting any said data determined to be displayed, and

means for presenting said formatted data to said display substantially concurrent with the reception of said ACD data.

4,510,352
TROLLEY POLE

Francis A. May, Pittsburgh, and Larry Patts, McMurray, both of Pa., assignors to Consolidation Coal Company, Pittsburgh, Pa.

Filed Aug. 19, 1982, Ser. No. 409,648
Int. Cl.³ B60L *5/12*
U.S. Cl. 191—64 11 Claims



1. A trolley pole assembly comprising,

a hollow pole having an upper end portion and a lower end portion,

a passageway extending the length of said pole from said upper end portion of said lower end portion,

a trolley wire contact shoe mounted on said pole upper end portion,

a base member adapted to support said pole for movement of said trolley wire contact shoe into and out of contact with a trolley wire,

said base member including a tubular housing having a bracket positioned adjacent said pole lower end portion, said tubular housing having a bore therethrough,

connector means for connecting said pole lower end portion to said base member, said connector means having a pas-

sageway communicating with said pole passageway at said pole lower end portion,

means for sealingly connecting said connector means to said pole lower end portion,

said connector means being pivotally connected at one end to said bracket and adapted at an opposite end to receive said pole lower end portion,

said base member tubular housing bore communicating in a sealed relation with said connector means passageway to provide an impact resistant enclosure extending from said pole upper end portion through said pole passageway to said pole lower end portion and therefrom through said communicating arrangement of said connector means passageway and said tubular housing bore,

an electrical conductor extending through said impact resistant enclosure from connection to said trolley wire contact shoe at said pole upper end portion through said pole passageway to said pole lower end portion,

said electrical conductor extending from said pole lower end portion through said connector means passageway and through said base member tubular housing bore,

a flexible conduit positioned in said impact resistant enclosure and having an upper end and a lower end, said upper end being positioned in said pole passageway,

said flexible conduit extending out of said pole lower end portion and through said connector means passageway to said base member, said flexible conduit extending through said base member tubular housing bore,

said flexible conduit forming an arcuate path through said connector means passageway to said tubular housing bore to guide said electrical conductor along said arcuate path as said electrical conductor extends through said impact resistant enclosure from said pole lower end portion, said connector means, and into said base member,

resilient means positioned within said base member tubular housing for applying an upward force upon said connector means to pivot said trolley pole upwardly for contact of said trolley wire contact shoe with the trolley wire,

said resilient means surrounding said flexible conduit having a lower end compressed against said base member and an upper end applying an upward force upon said connector means,

a sleeve member positioned in said base member between said resilient means and said flexible conduit,

said sleeve member having an upper end portion and a lower end portion,

said sleeve member upper end portion abutting said resilient means and urged into contact with said connector means to pivot said connector means on said base member to move said trolley pole to a raised position,

said sleeve member lower end portion extending through said base member and being extended and retracted relative to said base member upon expansion and contraction of said resilient means as said trolley pole is raised and lowered, and

said electrical conductor sealingly enclosed within said flexible conduit along the path of said electrical conductor through said impact resistant enclosure from said hollow trolley pole through said base member.

4,510,353

METHOD AND KIT FOR CONSTRUCTION OF CUSTOM PROTOTYPE MEMBRANE SWITCH PANEL

Anthony R. Nemitz, Houston, Tex., assignor to Arrow Display Company, Inc., Harris County, Tex.

Filed Jan. 31, 1983, Ser. No. 462,314

Int. Cl.³ H01H *9/00, 11/00, 13/70*

U.S. Cl. 200—5 A **30 Claims**

1. A membrane switch comprising:

an upper membrane;

a lower membrane;

a spacer disposed between said upper and lower membranes and defining an aperture therethrough;

a first conductive path disposed between said spacer and said upper membrane;

a second conductive path disposed between said spacer and said lower membrane;

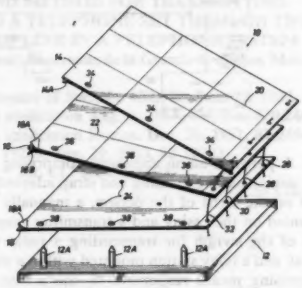
at least a portion of one of said first and second conductive paths moving through said aperture and into electrical contact with the other of said first and second conductive paths upon relative inward displacement of one of said membranes toward the other of said membranes; and wherein

at least a portion of said first conductive path is comprised of:

a first conductive element disposed between said spacer and said upper membrane and comprising:

a first insulative base; and

a first conductive trace bonded to and forming an integral part of said first insulative base prior to



said first conductive path being disposed between said spacer and said upper membrane.

10. A kit capable of being assembled into a prototype membrane switch comprising the combination of:

an upper membrane;

a lower membrane;

a spacer adapted to be disposed between said upper and lower membranes and to receive an aperture therethrough;

a first conductive element adapted to be disposed between said upper membrane and said spacer; and

a second conductive element adapted to be disposed between said lower membrane and said spacer, at least one of said first and second conductive elements comprising an insulative base and a conductive trace bonded to said base prior to said disposing of said at least one of said first and second conductive elements between said upper or lower membrane and said spacer, respectively.

4,510,354

CURRENT TAP SELECTING SWITCH

Lars P. Alifather, Guilderland, N.Y., assignor to Doble Engineering Company, Watertown, Mass.

Filed Apr. 12, 1984, Ser. No. 599,463

Int. Cl.³ H01H *19/54*

U.S. Cl. 200—11 R **4 Claims**

1. Apparatus for selecting a tap of a high power current source and providing a signal representative of the tap selected comprising,

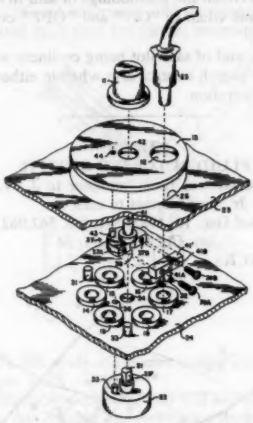
a plurality of terminal means for carrying current,

means for supporting said plurality of terminal means spaced along a predetermined path and equiangularly disposed about an axis for connection to a respective tap of the current source and for receiving an external connector for connection to an external load,

tap select means formed with an opening for selectively

exposing one of said terminal means while covering the others,

a rotary switch having its shaft centered about said axis comprising an actuating member mechanically connected to said tap select means for providing an electrical signal representative of the terminal means then exposed by said opening and electrically isolated from said



and means for displacing said tap select means relative to said terminal means to move said opening to positions exposing any selected one of said terminal means while correspondingly moving said actuating member to enable said rotary switch to provide an electrical conducting path representative of the terminal means then exposed by said opening.

4,510,355

ROTARY SHAFT - PUSH BUTTON SWITCH ANCHOR ASSEMBLY

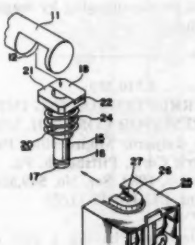
Haruo Atsumi, Otsu, and Haruyuki Koizumi, Kyoto, both of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Continuation of Ser. No. 328,682, Dec. 8, 1981,. This application Nov. 30, 1983, Ser. No. 557,409

Claims priority, application Japan, Dec. 15, 1980, 55-177534

Int. Cl.³ H01H *3/16, 3/54*

U.S. Cl. 200—47 **4 Claims**



1. A switch assembly which comprises in combination:

(A) a switch casing having a cylindrical through hole therein and an actuator head mounted on the switch casing, said casing and head together defining a chamber coaxial with said through hole;

(B) a push-button switch having contact elements and a push button supported for movement between projected and depressed positions, said push-button switch being housed within said switch casing on one side of a wall portion of said switch casing opposite to the actuator head;

(C) a switch operating mechanism operatively housed within said actuator head and including;

(1) a rotary actuator shaft movable between at least operative and inoperative positions, said rotary actuator shaft having a flattened portion near one end thereof facing in the direction of said push button when in the inoperative position;

(D) a plunger and sleeve assembly having a plurality of operative capabilities and mounted in said through hole and chamber;

(1) a rotary cylindrical sleeve slidingly mounted in said chamber and said through hole, said sleeve having a radially outwardly projecting flange at the upper end thereof, and said flange having a recessed portion; and

(2) a rotary plunger for transmitting the movement of the actuator to the push button, said plunger being slidingly mounted in said sleeve and having a flange at a first end thereof radially outwardly extending to one side and of a size equal to said recessed portion and being juxtaposed therewith, said flanges together abutting said flattened portion of said actuator shaft, and a second end of said plunger movably extending through the wall portion of the switch casing and terminating adjacent said push button;

(3) Whereby the rotation of said plunger and sleeve assembly within said through hole and chamber provide at least first and second operative capabilities of said switch assembly when said rotary actuator shaft is rotated;

(E) means for removably connecting the second end of the plunger to said push button in axially non-removable and rotatable fashion; and

(F) a biasing element for biasing the sleeve upwardly whereby the contact elements of said switch may be forcibly separated from each other by the action of the biasing element.

4,510,356

LIQUID METAL SWITCH APPARATUS

John A. Malm, 19731 Frazier Dr., Rocky River, Ohio 44116

Filed Sep. 30, 1983, Ser. No. 537,952

Int. Cl.³ H01H *31/00*

U.S. Cl. 200—48 R **22 Claims**

1. A high amperage electrical switching apparatus comprising:

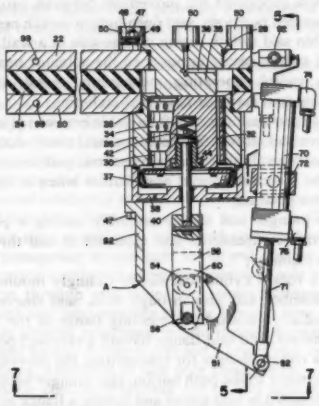
a first terminal member including a piston chamber and a movable piston contact member housed therein;

a second terminal member;

an insulating member secured between said first terminal and said second terminal to prevent electrical contact therebetween unless said piston is in electrical contact with said second terminal member;

at least one sliding contact current transfer means provided on said movable piston member for continuously main-

taining contact between said piston member and said first terminal member; and



actuating means for selectively actuating said movable piston to establish electrical contact between said first and second terminal members.

4,510,357

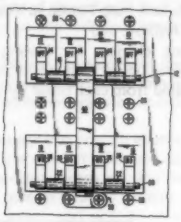
ACTUATOR FOR TRANSFER CIRCUIT BREAKER SWITCH

Bruce Winterbottom, Box 46, River Rd.-Lower Bank, Egg Harbor, N.J. 08215

Filed Jan. 26, 1984, Ser. No. 574,136

Int. Cl.[3] H01H *9/20*

U.S. Cl. 200—50 R **3 Claims**



1. In a circuit breaker configuration of the type in which individual switch components are aligned adjacent one another and whose condition of operation is determined by the respective positionings of the control arms thereof, in which a first plurality of such switch components are interconnected together for a simultaneous tandem operation of a first type, in which a second plurality of such switch components are interconnected together for a simultaneous tandem operation of a second, different type, and in which said first and second pluralities of switch components include first and second control arms oriented so that said arms are positioned away from each other when said switch components are on and towards each other when said switch components are off, apparatus comprising:

rod means, coupled between the control arms of adjacent switch components in each of said first and second switch component pluralities, and linking said arms of each plurality together;

an interlock;

with a first end of said interlock being apertured to receive said rod means of one of said switch component pluralities, and to transfer to said rod means substantially any lineal movement imparted to said interlock;

with an opposite end of said interlock being slotted to receive said rod means of the other of said switch component pluralities, in affording a degree of lineal movement therein;

with the length of said slot being slightly less than the lineal distance between the positionings of said first and second control arms when in "ON" and "OFF" conditions, respectively;

and with one end of said slot being co-linear with the position of the switch control arm when in either of its states of on-off operation.

4,510,358

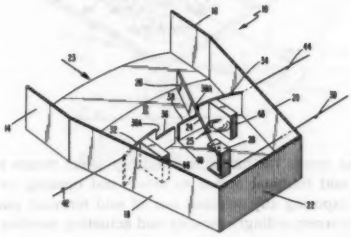
FLUID ACTUATED SWITCH

John Cook, Cottontown, Tenn., assignor to J. W. Graves and Harold Tate, Jr., part interest to each

Filed Dec. 16, 1983, Ser. No. 562,062

Int. Cl.[3] H01H *35/24*

U.S. Cl. 200—81 R **9 Claims**



1. A fluid actuated switch comprising fluid receiving means having two spaced fluid directing side walls forming a channel, a fluid actuated vane movable between said side walls in said channel in response to fluid directed by said side walls, movable switch contact means connected to said vane, electrically conductive stationary contact means adjacent each of said side walls within said channel for selective engagement with said vane, said movable switch contact means closing a first electrical circuit and opening a second electrical circuit when said vane is actuated from one side to the other side of said channel and means adjustably holding said vane and said movable switch contact means into contact with either one of said stationary contact means, said adjustable holding means comprising a permanent magnet mounted adjacent each of said stationary contact means in said channel and bendable tabs on said moveable contact means engaging by magnetic force the appropriate said magnet.

4,510,359

CIRCUIT INTERRUPTER HAVING IMPROVED CLOSING RESISTOR CONTROL MEANS

Ben J. de Calvino y Teijeiro, Monroeville, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 8, 1983, Ser. No. 549,856

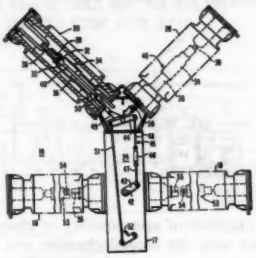
Int. Cl.[3] H01H *33/16*

U.S. Cl. 200—144 AP **8 Claims**

1. In a circuit interrupter having a pair of interrupter contacts that are movable into and out of engagement with one another in predetermined synchronized timed-sequence with a pair of impedance contacts that are also movable into and out of engagement with one another and, when engaged, connect a closing impedance means in parallel relationship with the interrupter contacts a controlled interval of time prior to the closing of said interrupter contacts, the combination comprising;

means for actuating the interrupter contacts including a first rotatable lever,

means for actuating the impedance contacts including a second rotatable lever and a coupled timer-latch assembly that is adapted to control the opening and closing of the impedance contacts in accordance with said predetermined synchronized timed-sequence and is resettable so that the predetermined synchronized timed-sequence actuation of said interrupter and impedance contacts can be repeated each time the circuit interrupter is operated



through a full cycle of circuit-opening and circut-closing operations, and

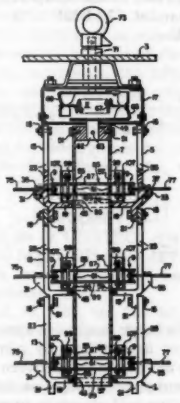
means mechanically coupling said first and second rotatable levers to one another and having a component that automatically compensates for variations in the relative positions of said levers during the operation of the circuit interrupter which would prevent the timer-latch assembly from being reset and thus rendered inoperative to connect the closing impedance means in the circuit prior to the next closure of the interrupter contacts.

4,510,360

CIRCUIT BREAKER WITH ARC SHIELD

Gregory J. Golub, Athens, Ga., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jun. 8, 1983, Ser. No. 502,373
Int. Cl.³ H01H *9/30, 33/04*
U.S. Cl. 200—151 **2 Claims**



1. An electrical switching contact assembly comprising:

(a) a housing member having a base plate with a circular opening;

(b) first and second stationary contacts;

(c) means disposed on the base plate for mounting the first and second stationary contacts symmetrically about the circular opening and in a plane substantially perpendicular to the longitudinal axis of the circular opening;

(d) a longitudinal shaft extending into the circular opening;

(e) external means connected to the shaft for rotating the shaft between open and closed circuit positions;

(f) a movable contact assembly on the shaft and including a pair of parallel conductors having first and second end portions, the end portions of the first pair of conductors being engagable with opposite sides of the first stationary contact and the end portions of the second pair of conductors being engagable with opposite sides of the second stationary contact;

(g) spring clamping means on each pair of end portions for holding the end portion in clamping engagement with the corresponding stationary contacts;

(h) a cylindrical shielding member of electrically insulating material surrounding the shaft and the spring clamping means; and

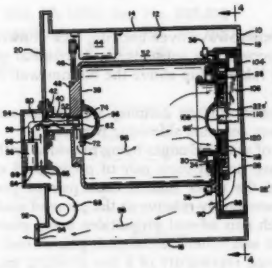
(i) mounting means for mounting the shielding member and including holes through which the end portions extend and support the member in place whereby the shielding member increases the dielectric strength between the contacts in the open position.

4,510,361

HORIZONTAL AXIS TUMBLER TYPE MICROWAVE DRYING MECHANISM

Douglas P. Mahan, 4300 SW. 188th, Aloha, Oreg. 97007

Filed May 3, 1982, Ser. No. 374,508
The portion of the term of this patent subsequent to Jun. 8, 1999, has been disclaimed.
Int. Cl.³ H05B *6/78*
U.S. Cl. 219—10.55 A **4 Claims**



1. Microwave drying mechanism for removing moisture from articles comprising

a housing including front and rear portions,

a hollow tumbler-type microwave opaque drum having a front loading opening, a rear wall, and an inner cavity arranged to receive articles from which moisture is to be removed,

said housing also having a front opening for access to said drum opening,

support means rotatably supporting said drum on substantially a horizontal axis,

drive means arranged to rotate said drum whereby articles being dried tumble laterally across the interior of said drum,

first microwave power means disposed with the output thereof directed into the rear of said cavity for applying its radiation energy to tumbling articles in said drum,

a door on said housing at said housing opening,

second microwave power means mounted on said door and disposed with the output thereof directed into the front of said cavity for applying its radiation energy to tumbling articles in said drum,

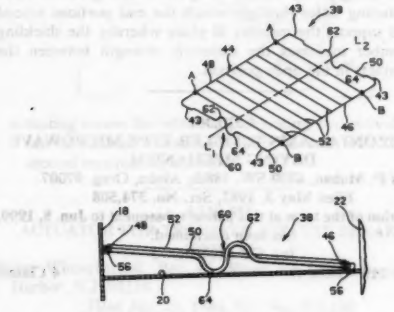
an electric circuit for said power means,
control means in said circuit for said power means,
auxiliary housing means enclosing said first microwave power means and auxiliary housing means enclosing said second microwave power means,
and forced air means directed into said auxiliary housing means from the rear of said housing to flow along said first power means, then through said cavity, and then along said second power means whereby to cool both said power means and also to remove moisture.

4,510,362

MICROWAVE OVEN RACK DESIGN

Matthew S. Miller, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed May 21, 1984, Ser. No. 612,143
Int. Cl.³ H05B 6/64
U.S. Cl. 219—10.55 E **14 Claims**



1. A microwave oven cooking rack construction adapted to be supported in a substantially horizontal position in spaced parallel relationship above the bottom wall of said oven comprising:
a support surface defining a plane on said rack including front, rear and side edge portions;
each of said side edges being provided with a pair of projections, one of each pair of projections extends upwardly and the other one of each pair of projections extends downwardly relative to the plane of said rack, said one of each pair of said projections being positioned forwardly and said other one of each pair of said projections positioned rearwardly of a line dividing said rack between a fore and aft portion, whereby in the event said rack is placed on said bottom wall either said one or said other one of each pair of projections will contact said bottom wall and cause said rack to pivot thereabout so that said support surface defining said plane will lay at an angle relative to said substantially flat bottom wall to thereby prevent inadvertent use of said rack when it is positioned on said bottom wall.

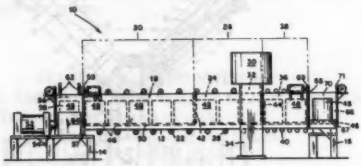
4,510,363

KILN FOR HOT-PRESSING COMPACTS IN A CONTINUOUS MANNER

Carl D. Reynolds, Jr., Clinton, Tenn., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 8, 1983, Ser. No. 521,496
Int. Cl.³ H05B 6/02
U.S. Cl. 219—10.71 **7 Claims**

1. A hot pressing kiln for heating, hot pressing, and cooling compacts in a continuous manner, comprising:
an elongated, horizontally disposed housing;
a plurality of chambers serially arranged in said housing;
a first chamber of said plurality of chambers disposed in registry with one end of said housing for defining a preheating zone;
heating means for heating said preheating zone;
a second chamber of said plurality of chambers disposed in registry with the first chamber for defining a heating stabilization and hot-pressing zone;
at least one die means for containing hot-pressable material;
further heating means and press means operatively associated with said second chamber with said press means being disposed in said second chamber and comprising a hydraulic press with a ram penetrating said housing and contactable with the heated contents of said die means for effecting the hot pressing thereof;



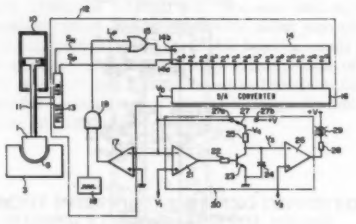
a third chamber of said plurality of chambers disposed in registry with the second chamber and the other end of said housing opposite said one end for defining a cooling zone; and
means for displacing said at least one die means sequentially through said chambers while sequentially preheating the contents of said die means in the first chamber, providing temperature equilibration and hot pressing of the contents of said die means in the second chamber, and cooling the hot pressed contents of said die means in the third chamber.

4,510,364

ELECTRIC DISCHARGE MACHINING APPARATUS

Tetsuro Ito, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP81/00014, § 371 Date Sep. 10, 1981, § 102(e) Date Sep. 10, 1981, PCT Pub. No. WO81/02127, PCT Pub. Date Aug. 6, 1981
PCT filed Sep. 10, 1981, Ser. No. 302,480
Claims priority, application Japan, Jan. 22, 1980, 55-6109; Apr. 23, 1980, 55-53868; Apr. 23, 1980, 55-53869; Apr. 23, 1980, 55-53870; Apr. 23, 1980, 55-53872; Apr. 23, 1980, 55-53873
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 G **81 Claims**



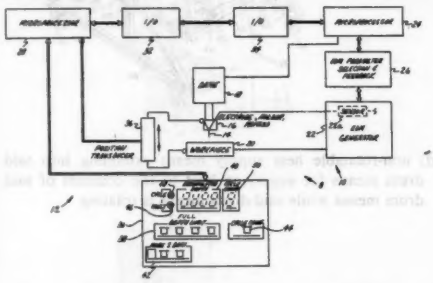
1. An electric discharge machining apparatus of the type in which a workpiece is machined by generating an electric discharge across a machining gap between a confronting electrode and said workpiece through an insulating machining solution while feeding said electrode to said workpiece, said apparatus comprising: electrode position detecting means for detecting, during a present electric discharge machining operation, a difference value between the present position of said electrode relative to said workpiece and a most advanced position of said electrode detected during said present electric discharge of machining operation; first means for outputting a signal by identifying the interelectrode state on the basis of said difference value detected by said electrode position detecting

means; and means for controlling the operation of said electric discharge machining apparatus in accordance with said signal output from said first means.

4,510,365
ELECTRONIC DEPTH CONTROLLER FOR EDM APPARATUS

John R. MacGregor; Gary F. Rupert, both of Ann Arbor, and Thomas M. Kennedy, Chelsea, all of Mich., assignors to Raycon Corporation, Ann Arbor, Mich.

Filed May 6, 1982, Ser. No. 375,501
Int. Cl.³ B23P 1/08, 1/14
U.S. Cl. 219—69 G 6 Claims



1. In EDM apparatus for machining holes in conductive workpieces via electrode means mounted on a holder which is advanced toward such a workpiece by a drive means, said apparatus including a main control system comprising means for controlling the advance of said drive means including means for causing said drive means to advance said electrode means at an advance rate toward the workpiece, sensing means for sensing the initiation of machining as said electrode means approaches the workpiece, said main control system comprising means responsive to said sensing means for causing said drive means to reduce the advance rate of said electrode means to a slower one in response to initiation of machining, and an electronic depth control system operatively coupled with said main control system comprising input means for setting a desired hole depth to be machined by said electrode means in the workpiece, means for setting a reference datum from which the desired hole depth is to be measured, and position sensing means for providing a signal of the position of said holder relative to the workpiece, the improvement which comprises means for establishing said reference datum by detection of the occurence of a particular characteristic of the signal of said position sensing means caused by reduction in the advance rate of said electrode means by said main control system upon initiation of machining.

4,510,366
FLUID DELIVERY RATE CONTROL TW ELECTRICAL MACHINING METHOD AND APPARATUS

Kiyoshi Inoue, Tokyo, Japan, assignor to Inoue-Japax Research Incorporated, Yokohama, Japan

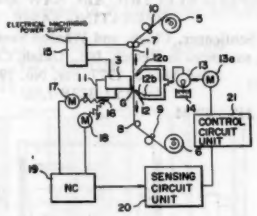
Filed Jul. 30, 1982, Ser. No. 403,708
Claims priority, application Japan, Jul. 31, 1981, 56-121198
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 M 12 Claims

1. A method of electrical-machining an electrically conductive workpiece, comprising the steps of:

axially transporting a continuous wire-electrode from a supply side to a takeup side to cause the wire electrode to continuously traverse the workpiece while defining a machining gap therewith supplied with a machining liquid;

passing an electrical machining current through the liquid flooded machining gap between the traveling wire electrode and the workpiece to electroerosively remove material from the latter;

relatively displacing the workpiece and the traveling wire electrode transversely to the axis of the wire electrode along a programmed cutting path of a predetermined shape corresponding to a desired contour to be formed in the workpiece; and



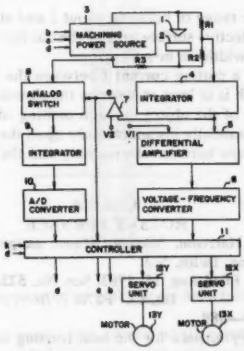
varying the rate of supply of said machining liquid into sad machining gap as a function of the shape of said programmed cutting path, said programmed cutting path including successive sections intersecting at an angle and said supply rate is increased selectively in a region of said intersection

at least immediately prior to arrival of the axis of said wire electrode at a turning point defining said intersection.

4,510,367
WIRE-CUT ELECTRIC DISCHARGE MACHINE

Haruki Obara, Sagamihara, Japan, assignor to Fanuc Ltd., Tokyo, Japan

Filed Jun. 17, 1983, Ser. No. 505,478
Claims priority, application Japan, Jun. 30, 1982, 57-112807
Int. Cl.³ B23P 1/08
U.S. Cl. 219—69 W 4 Claims



1. A wire-cut electric discharge machine having a servo feed system in which a workpiece and a wire electrode are moved relative to each other to cut, in accordance with electric cutting conditions, the workpiece via a discharge into a desired shape, said machine comprising:

cutting current detecting means for detecting a true cutting current;

feed rate detecting means for detecting the relative feed rate of the workpiece and the wire electrode;

input means for inputting the width of a cutting groove;

thickness detecting means for detecting the thickness of the workpiece on the basis of the current detected by the cutting current detecting means, the feed rate detected by

the feed rate detecting means and the width of the cutting groove from the input means; and

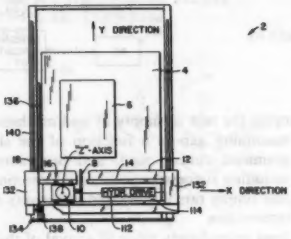
control means for changing over the electric cutting conditions on the basis of the thickness determined by the thickness detecting means.

4,510,368

HIGH SPEED ELECTRIC ARC SAW AND METHOD OF OPERATING SAME

Max P. Schlienger, Ukiah, and Whalun Szeto, Novato, both of Calif., assignors to Retech, Inc., Ukiah, Calif.

Filed May 5, 1977, Ser. No. 793,991
Int. Cl.³ B23P *1/02*
U.S. Cl. 219—69 M **44 Claims**



1. A method for cutting a metal object comprising the steps of providing a saw member; applying a voltage differential between the object and the member; advancing the saw member into close proximity with the object; determining a threshold current I_o between the member and the object which equals

$$a \cdot s \cdot 10^6 \text{ amps}$$

wherein

a is in the range of between about 2 and about 16;

s is the effective surface area of the cut (arc segment length × kerf width) in m^2;

and passing a cutting current I between the member and the object which is at least as large as the threshold current I_o so that cutting of the object through melting of the metal commences substantially instantaneously upon the commencement of current flow between the member and the object.

4,510,369

ROTARY FURNACE

William S. Harrison, Marion, Mass., assignor to Engelhard Corporation, Iselin, N.J.

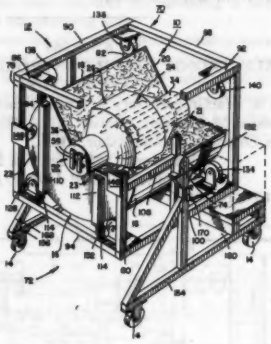
Filed Aug. 15, 1983, Ser. No. 523,234
Int. Cl.³ F27B *7/10*
U.S. Cl. 219—389 **34 Claims**

1. A rotary furnace for the heat treating of materials comprising,

(a) a drum means for containing materials to be heat treated,

(b) said drum means including an outer member having an outer shell and opposite base members, the outer shell having an outer surface, an inner member having an inner shell spaced from the outer shell, means for freely supporting said inner shell with respect to said outer member to permit free expansion and contraction of said inner shell with respect to said outer member,

(c) means for rotating said drum means, which includes means for rotating said outer member, and further including, an insulating means disposed between said inner and outer members, said insulating means having a pre-determined joining contact with said inner and outer members such that rotation of said outer member causes rotation of said inner member by virtue of set pre-determined joining contact, and



(d) non-rotatable heat supply means extending into said drum means for supplying heat to the contents of said drum means while said drum means is rotating.

4,510,370

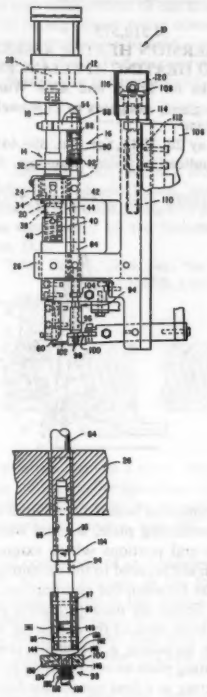
FUSING MACHINE

Charles F. Szantho, Roselle Park, and Edward D. Riordan, S. Somerville, both of N.J., assignors to Joyal Products, Inc., Linden, N.J.

Division of Ser. No. 364,218, Apr. 1, 1982, , which is a division of Ser. No. 203,446, Nov. 3, 1980, Pat. No. 4,371,772. This application Aug. 11, 1983, Ser. No. 522,099
Int. Cl.³ B23K *9/28*
U.S. Cl. 219—86.25 **9 Claims**

1. A fusing machine, comprising a frame; a fusing electrode assembly mounted for reciprocating movement relative to said frame in a first direction, in which said fusing electrode assembly moves towards a workpiece, and a second direction opposite to said first direction; and a ground electrode assembly suspended from said fusing electrode assembly, said ground electrode assembly including a ground electrode shaft mounted for reciprocating movement relative to said frame in said first and second directions, pivotable supporting means for supporting a ground electrode such that said ground electrode is pivotable relative to said ground electrode shaft, said supporting means being positioned below said ground electrode shaft, and adjusting means connected between said ground electrode shaft and said supporting means for adjusting the position of said ground electrode in said first and second directions by pivoting said supporting means relative to said ground electrode shaft, said adjusting means including rolling means for rolling along said supporting means as said adjusting means

moves in said first and second directions to pivot said supporting means relative to said ground electrode shaft and maintain-



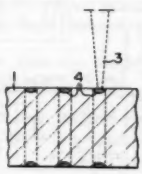
ing means for maintaining said rolling means in engagement with said supporting means.

4,510,371

METALLIC SCALES AND METHOD OF MANUFACTURING THE SAME

Hiromi Nakamura, Ebina; Zenichi Mochizuki, Fuji; Noriyuki Motomura, and Sadayoshi Yamada, both of Zama, all of Japan, assignors to Toshiba Kikai Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 18, 1982, Ser. No. 359,530
Int. Cl.³ B23K *27/00*
U.S. Cl. 219—121 LM **16 Claims**



1. A method of preparing a metallic scale comprising the steps of:

preparing a linear metallic blank provided with a plated layer of a metal alloy consisting of 92–95% by weight of nickel and 5–8% by weight of phosphorus; and

applying, at a definite spacing, high density energy in the form of a fine line onto a surface of said plated layer so as to change permeability of portions of said plated layer subjected to said high density energy;

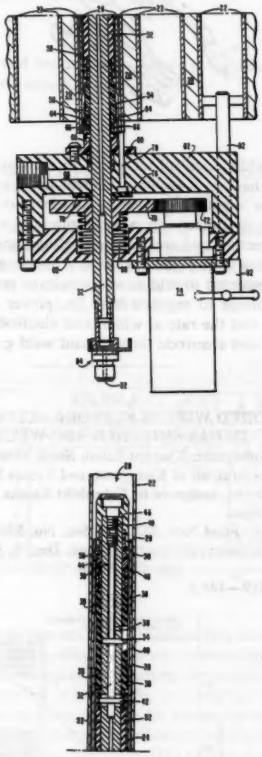
said permeability changed portions forming graduations of said metallic scale.

4,510,372

SLEEVE-TO-TUBE WELDER

Richard M. Kobuck, Delmont, and Arthur F. Jacobs, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Aug. 18, 1982, Ser. No. 409,209
Int. Cl.³ B23K *9/12*
U.S. Cl. 219—125.11 **14 Claims**



1. A welding apparatus for welding within a tubular member comprising:

an electrically conductive central shaft capable of being disposed in a tubular member with said central shaft having a welding electrode attached thereto for establishing a weld on the internal surface of said tubular member and with said central shaft having a channel therethrough for conducting an inert gas to near said electrode;

a first sealing means disposed on said central shaft on one side of said electrode and a second sealing means disposed on said central shaft on the other side of said electrode for defining a sealed chamber between said welding apparatus and said tubular member when said first sealing means and said second sealing means are actuated by movement of said central shaft relative to said tubular member; and

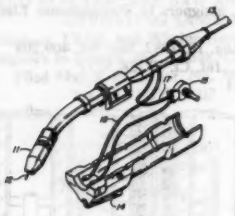
rotation means connected to said central shaft for rotating said central shaft and said electrode in said tubular member.

4,510,373

CONTROL FOR WELDING SYSTEM

Ron Cox, 2208 Victoria St., Windsor, Ontario, Canada, and Elzi Pettovello, 6326 Appoline Dr., Dearborn, Mich. 48233

Filed Feb. 17, 1984, Ser. No. 581,151
Claims priority, application Canada, Sep. 23, 1983, 437440
Int. Cl.³ B23K *9/10*
U.S. Cl. 219—137.71 10 Claims



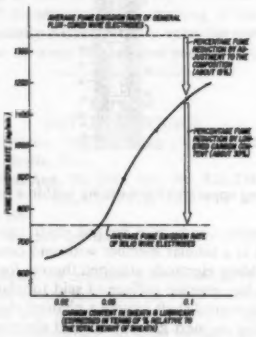
1. A welding control for use in an arc welding assembly of the type having: a welding control unit including a power supply for supplying power to an electrode and to feeding means for said electrode; a weld gun; and a flexible conduit interconnecting said welding control unit and said weld gun, said welding control unit including a first single potentiometer means connected to said power supply to produce a variable output voltage to regulate both the power supplied to said electrode and the rate at which said electrode feeding means advances said electrode through said weld gun.

4,510,374

FLUX-CORED WIRE ELECTRODE SUITABLE FOR USE IN GAS-SHIELDED ARC-WELDING

Minoru Kobayashi; Yoshiya Sakai; Shoji Minato; Tsuguo Ooe; Katsumi Arai, all of Kanagawa, and Tetsuo Suga, Yokohama, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Nov. 30, 1983, Ser. No. 556,602
Claims priority, application Japan, Dec. 6, 1982, 57-213764
Int. Cl.³ B23K *35/00*
U.S. Cl. 219—146.1 10 Claims



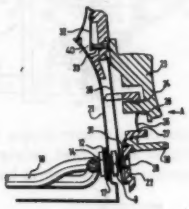
1. A flux-cored wire electrode suitable for use in gas-shielded arc-welding comprising a sheath of soft steel, a lubricant and a flux-core, wherein the sum of the carbon content of said sheath and lubricant is 0.045 wt.% or less of the total weight of said sheath, and wherein said sheath is filled with said flux to an amount of 10–30 wt.% of the total weight of said electrode, said flux consisting essentially of 20–50 wt.% of TiO_2, 1–15 wt.% of SiO_2, 2.5–10 wt.% of ZrO_2, 0.1–5 wt.% of an arc-stabilizing agent, 10–45 wt.% of a deoxidizer and up to 50 wt.% of iron powder.

4,510,375

ELECTRIC IMMERSION HEATER ASSEMBLY FOR LIQUID HEATING APPLIANCES

Michael Inskip, Stoke on Trent, and Alan Warren, Western Downs, both of England, assignors to Ti Russell Hobbs Limited, United Kingdom

Filed May 20, 1982, Ser. No. 380,445
Claims priority, application United Kingdom, May 28, 1981, 8116219
Int. Cl.³ H05B *1/02, 3/82;* A47J *27/21*
U.S. Cl. 219—328 16 Claims



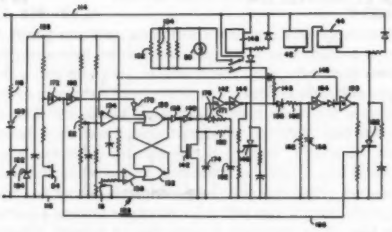
1. An electrical immersion heater for a liquid heating appliance, comprising a mounting plate, a metal sheathed heating element having two end portions which extend through an opening in and which are secured to the mounting plate and an active heating portion between the end portions, and a single fastening device for fixing the mounting plate and hence the heating element to a body shell of the appliance, at least part of the fastening device including a thermally conductive stud secured to said mounting plate so as to project to the outside of the body shell for acting as a heat conductor from the heating element to a safety cut-out device for the appliance supported on the outside of the body shell, and a part of the active portion of the heating element being directly connected only to said thermally conductive stud of said fastening device.

4,510,376

VARIABLE TIMING SYSTEM FOR TOASTERS AND SIMILAR APPLIANCES

William C. Schneider, Toms River, N.J., assignor to Alco Foodservice Equipment Company, Miami, Fla.

Filed Jul. 22, 1982, Ser. No. 400,893
Int. Cl.³ H05B *1/02*
U.S. Cl. 219—492 7 Claims



1. An appliance which operates by applying heat to one or more articles in a compartment comprising: heating means; means for initiating operation of the heating means; timing means for establishing a heating cycle and for automatically shutting off the heating means at the end of the heating cycle;

and means providing a signal responsive to the duration of the interval between every two successive heating cycles, said signal being independent of the temperature within said compartment and also independent of the temperature of the heating means, the timing means being connected to receive said signal and being responsive to said signal and operative to shorten the second of said two successive heating cycles when said signal indicates that the immediately preceding interval is shortened.

4,510,377

SMALL CARTRIDGE HEATER

Francis L. Merritt, Redondo Beach, and Charles H. Taylor, Rolling Hills, both of Calif., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 6, 1984, Ser. No. 577,391
Int. Cl.³ H05B *3/02*
U.S. Cl. 219—550 **5 Claims**

1. A heater in the form of a small cartridge of the order of one inch long; with a smaller diameter, for use as a catalyst bed heater in a spacecraft thruster, to maintain the bed at a predetermined temperature greater than 200° F., said heater comprising:

a cylindrical core made of an insulating refractory ceramic, said core having grooves in the form of a double lead helical thread formed in the surface thereof;

a wire element in the form of a helical coil located in said grooves, starting in one lead and returning in the other lead in a single layer, the coil axis being along the length of the grooves;

said wire element located near the heat emitting surface of the heater and the wire element positioned an equal distance from the surface of said core;

an outer ring of electrically insulating but heat conducting refractory ceramic material in tubular form surrounding said core, said outer ring being split and formed from two symmetrical halves lengthwise, having inner and outer surfaces of simple cylindrical form at least for the portion surrounding the helical thread; and

a housing having a tubular portion surrounding said outer ring;

the size of the wire element, and the heat conduction from the wire element through the outer ring and the housing, being adequate to maintain said temperature at the bed.

4,510,378

PORTABLE VOTING BOOTH

Richard G. Dolson, Canton, Conn., assignor to Veeder Industries Inc., Hartford, Conn.

Filed Oct. 19, 1983, Ser. No. 543,392
Int. Cl.³ G07C *13/00*
U.S. Cl. 235—50 R **40 Claims**

1. A portable voting booth expandable from a storage mode to a voting mode and collapsable from said voting mode to said storage mode comprising:

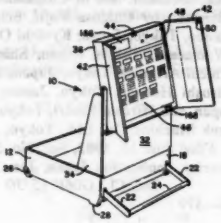
a base storage container;

a support console pivotally mounted to said container;

a voting console having a ballot display means and pivotally mounted to said support console;

a booth means connected to said voting console and expandable to visually isolate said ballot display means;

said booth means, voting console, and support console being receivable in nestled relationship within said storage container in a storage mode and being expandable to a stable voting mode wherein said ballot display means is presented in a generally upright position relative to said container and said ballot display means is visually isolatable by said booth means.

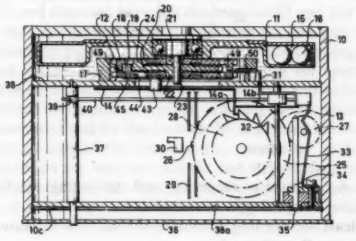


4,510,379

CONTROL DEVICE FOR RECORDING DISTANCE MEASURING INSTRUMENT ATTACHED TO A VEHICLE HUB

Sven Wallqvist, and Rune Sund, both of Halmstad, Sweden, assignors to Haldex AB, Halmstad, Sweden

Filed Nov. 7, 1983, Ser. No. 549,467
Claims priority, application Sweden, Nov. 11, 1982, 8206418
Int. Cl.³ G01C *22/00*
U.S. Cl. 235—95 C **10 Claims**



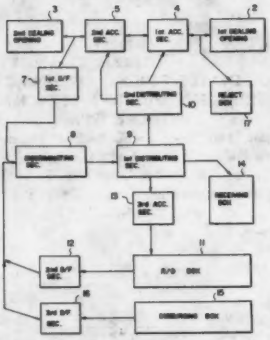
1. A control device for an instrument (**10**) attached to a vehicle wheel for recording the distance covered by a vehicle, which instrument comprises a counting mechanism with several number-carrying wheels (**25**), a stamping mechanism (**29,30**) for stamping cards, a means for advancing number-carrying wheels of the counting mechanism in response to the distance covered, and a pendulum (**11**) having an oscillation axis which coincides with the vehicle wheel axle, and which by substantially standing still effects a relative movement in relation to the instrument, which movement is utilized for driving via a gear unit (**12**) the means for advancing the number-carrying wheels of the counting mechanism, characterized in that the means for advancing the number-carrying wheels (**25**) of the counting mechanism comprise a feed hook (**14**), which is deformed permanently when the number-carrying wheels of the counting mechanism are blocked, and thereby effects permanent closing of a first electric contact (**14b-35**), and that a movable member (**18**) in the gear unit (**12**) is provided with at least one signal shoulder (**49**), which is capable at a certain movement transfer of the gear unit to alternatingly open and close a second electric contact (**33-34**), and that an element (**34,35**) of said first and second electric contact is provided for scanning the condition of the first electric contact when said vehicle wheel is stationary or moving and the second electric contact when said vehicle wheel is moving.

4,510,380

AUTOMATIC MONEY RECEIVING AND DISBURSING MACHINE

Isamu Uchida, deceased, late of Chigasaki, Japan (by Kazuko Uchida, heiress); by Chigusa Fujii, heiress, Tokyo, Japan; Eiichi Kokubo, Tokyo, Japan; Kyoichi Osako, Tokyo, Japan; Makoto Yamazaki, Tokyo, Japan; Shinichi Imura, Tokyo, Japan; Junichi Arikawa, Tokyo, Japan; Kowichi Goi, Tokyo, Japan; Hiroshi Hongou, Tokyo, Japan; Takashi Shinozaki, Tokyo, Japan, and Hiroshi Emori, Tokyo, Japan, assignors to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jun. 16, 1982, Ser. No. 388,983
Claims priority, application Japan, Jun. 19, 1981, 56-95109
Int. Cl.³ G06F *15/30*
U.S. Cl. 235—379 5 Claims



1. An automatic receiving and disbursing machine, said machine comprising:

at least one opening defined by the machine for movement of notes therethrough;

at least one accumulating means for accumulating the notes, said at least one accumulating means being in communication with said at least one opening;

a discriminating means for discriminating the notes received in said at least one accumulating means, said discriminating means selectively making one of a first discrimination wherein the notes are discriminated as to whether the notes are normal and a second discrimination wherein the notes are discriminated as to whether the notes are of a particular kind of note;

at least one receiving means for receiving the notes, the notes received by said at least one receiving means having been discriminated by the first discrimination of the discriminating means to be normal;

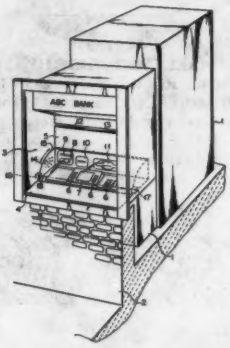
at least one distributing means for distributing the notes, the notes distributed by said at least one distributing means being distributed to said at least one accumulating means and to one of said at least one receiving means, the notes being distributed into said one of said receiving means being firstly distributed by said at least one distributing means to said at least one accumulating means after said first discrimination being effected by said discriminating means and then said second discrimination being effected to the notes having been discriminated by said first discrimination to be normal so as to select a particular kind of note to be distributed to said one receiving means.

4,510,381

AUTOMATIC TRANSACTION MACHINE

Kunio Fukatsu, Ebina, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed May 5, 1983, Ser. No. 492,032
Claims priority, application Japan, May 6, 1982, 57-75844
Int. Cl.³ G06F *15/30*
U.S. Cl. 235—379 9 Claims



1. An automatic transaction machine comprising:

a housing having an outer portion and an inner portion with respect to a wall;

a transaction medium insertion port disposed as said outer portion for inserting thereat a transaction medium on which transaction information is recorded;

reading means for reading the transaction information from the transaction medium inserted at said transaction medium insertion port;

an operation section for entering a sequence of transaction data associated with the transaction information on the transaction medium;

means for dispensing a negotiable medium in accordance with the transaction information read by said reading means from the transaction medium and with the transaction data entered at said operation section;

a shutter disposed to be opened/closed with respect to said operation section, said shutter having an arcuated shape so as to extend over said outer portion of said housing;

a shutter driving section for driving said shutter so as to open/close said shutter; and

a storage section for storing said shutter in said inner portion of said housing.

4,510,382

METHOD OF DETECTING FALSE DATA RECORDING MEDIA AND A DATA RECORDING MEDIUM THEREFOR

Hans-Jürgen Walter, Weil der Stadt, Fed. Rep. of Germany, assignor to Mico Datensysteme GmbH, Weil der Stadt, Fed. Rep. of Germany

Filed Feb. 22, 1983, Ser. No. 468,686
Claims priority, application Fed. Rep. of Germany, Jun. 19, 1982, 3223034
Int. Cl.³ G06K *5/00*
U.S. Cl. 235—380 11 Claims

1. A method for detecting false data recording media, particularly copies of magnetic cards which are adapted to store credit data in addition to identification and other information and used for presentation to one of a pre-determined plurality of automatic service rendering or product vending machines set up in an allowed area for eliciting a selective service or the dispensing of a product from any of said machines, with the value of said service or product elicited being subtracted from

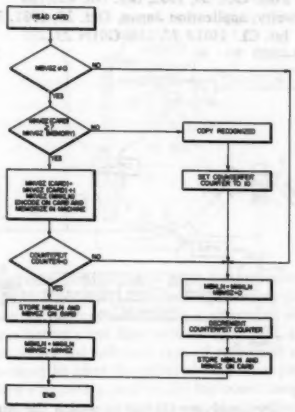
the user's existing credit and the remaining credit being restored on said data recording medium, characterized by the currently presented one of said automatic service machines, upon presentation of a data recording medium, performing the following steps in addition to those required for rendering said selected service or dispensing said selected product and for the associated credit subtraction, said steps comprising:

first, reading and memorizing a serial number encoded on said currently presented data recording medium to identify the same;

secondly, reading and memorizing the number of prior uses of said currently presented data recording medium as encoded thereon;

thirdly, reading the serial number of at least one other of said data recording media which during prior use of said currently presented data recording medium was encoded thereon by said automatic service machine then used, said serial number being encoded on said currently presented data recording medium;

fourthly, reading the number of previous uses of said at least one other data recording medium which was encoded on said currently presently data recording medium by said



automatic service machine priorly presented said current data recording medium, said number of previous uses thus being currently encoded on said data recording medium;

incrementing by one of the number of uses encoded on said currently presented data recording medium;

firstly, encoding on said currently presented data recording medium a serial number of at least one data recording medium previously presented to said automatic service machine currently used, said serial number having been memorized in said machine;

secondly encoding on said currently presented data recording medium the number of uses of said at least one data recording medium previously presented to said automatic service machine currently used, said number of uses having been memorized in said machine;

comparing the number of previous uses of said currently presented data recording medium as memorized in said currently used automatic service machine with the number of its previous uses as read; and

triggering a counterfeit detection signal in the event that the number of uses read by said automatic service machine is lower than the number of uses memorized.

4,510,383

DEVICE FOR THE OPTICAL IDENTIFICATION OF A CODING ON A DIAGNOSTIC TEST STRIP

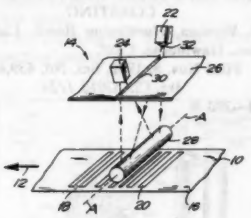
Uwe Ruppender, Mannheim, Fed. Rep. of Germany, assignor to Boehringer Mannheim GmbH, Mannheim, Fed. Rep. of Germany

Filed Aug. 31, 1982, Ser. No. 413,293

Claims priority, application Fed. Rep. of Germany, Sep. 18, 1981, 3137174

Int. Cl.³ G06K 7/10

U.S. Cl. 235—462 **8 Claims**



1. In an evaluation device into which a diagnostic test strip with a high information density bar coding of at least 10 bits per cm on a surface thereof is positively longitudinally movable relative to an optical bar code reader therein having a transmitter comprising light irradiating means and a receiver comprising light-sensitive means, the improvement wherein: the transmitter and the receiver are disposed on the same side of the test strip and wherein the reader comprises a single cylindrical lens disposed between the transmitter and the test strip and the receiver and the test strip with the lens axis running substantially parallel to the test strip surface carrying the coding and to the code bars, means forming a slit aperture between the cylindrical lens and the transmitter and between the cylindrical lens and the receiver, wherein the slit aperture for the transmitter and for the receiver lie in a plane defined by the cylindrical axis of the lens and the transmitter with the distance between the lens axis and the test strip surface being substantially such that the focus lines of the lens lie approximately in the test strip surface.

4,510,384

AUTOMATIC FOCUSING DEVICE WITH FREQUENCY WEIGHTED AMPLIFICATION

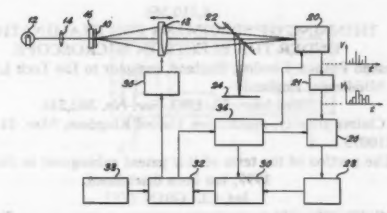
James B. Grimbleby, Reading, and Christopher G. Talbot, Cheltenham, both of England, assignors to National Research Development Corporation, London, England

Filed Aug. 16, 1982, Ser. No. 408,282

Claims priority, application United Kingdom, Aug. 17, 1981, 8125084

Int. Cl.³ G01J 1/20

U.S. Cl. 250—201 **10 Claims**



4. Focusing apparatus for focusing an optical system comprises receiving means for receiving an image from a focusing

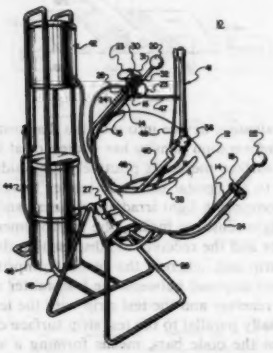
means; circuit means for deriving from the receiving means an electrical signal having a frequency distribution which corresponds to the spatial frequency disribution of said image; amplification means for applying to the electrical signal an amplification which is greater at high frequencies than at low frequencies; and adjusting means for adjusting the optical system in accordance with variations in the amplified signal.

4,510,385

SOLAR TRACKING SYSTEM EMPLOYING INERTIAL COASTING

Cornelis M. Welman, Huntington Beach, Calif., assignor to Mattel, Inc., Hawthorne, Calif.

Filed Nov. 8, 1982, Ser. No. 439,659
Int. Cl.³ G01J *1/24*
U.S. Cl. 250—203 R **8 Claims**



1. In a solar tracking system including a fixed-support, collector means for collecting the sun's rays along an axis, pivot bearings for rotatably attaching the collector means to the support, motive means for applying a force to rotate the collector means, and sun sensor means for energizing the motive means when exposed to sunlight, the improvement comprising:

shadow producing means mounted to rotate with the collector means for preventing the exposure of the sun sensor to sunlight when the axis of the collector means approaches the position of the sun to within a predetermined angle; and

means for coupling the motive means to the collector means so that the inertia of the motive means, the collector means and the shadow producing means causes the collector means to coast about the pivot bearings an amount substantially equal to the predetermined angle when the motive means is de-energized.

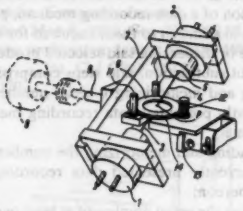
4,510,386

THINNING OF SPECIMENS FOR EXAMINATION UNDER THE ELECTRON MICROSCOPE

Joseph Franks, London, England, assignor to Ion Tech Limited, Middlesex, England

Filed Mar. 29, 1982, Ser. No. 362,531
Claims priority, application United Kingdom, Mar. 31, 1981, 8110073
The portion of the term of this patent subsequent to Jul. 20, 1999, has been disclaimed.
Int. Cl.³ G01N *1/32*
U.S. Cl. 250—251 **7 Claims**

1. A method of preparing specimens suitable for examination by electron microscopy techniques comprising providing a source for producing a beam consisting substantially exclusively of energetic or neutral particles, and irradiating a specimen by the beam thereby to erode the specimen to penetration



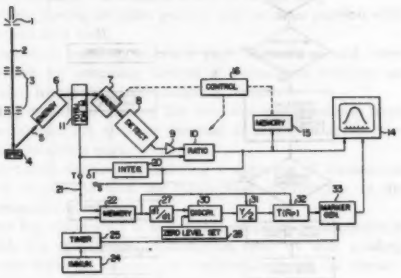
and produce an area surrounding the penetration of suitable thickness for transmission electrons.

4,510,387

ION MICRO-ANALYSIS

Eiichi Izumi, Takahagi, and Hifumi Tamura, Hachioji, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Oct. 20, 1982, Ser. No. 435,728
Claims priority, application Japan, Oct. 23, 1981, 56-170585
Int. Cl.³ H01J *37/256*; G01N *23/225*
U.S. Cl. 250—309 **20 Claims**



1. An ion micro-analyzer (IMA) in which the surface of a specimen is bombarded with a primary ion beam and secondary ions generated thereby are mass-analyzed, comprising:

means for generating a primary ion beam and bombarding the surface of a specimen with the primary ion beam;

means for detecting at least one species of secondary ions emitted from the specimen, and generating a monitoring signal corresponding to the species of secondary ions;

means for processing the monitoring signal to provide a relation between an implanted depth of the primary ions and an etching time corresponding to the implanted depth on the basis of a profile of the monitoring signal; and

means for providing an output indicative of a depth of an analyzed site in the specimen on the basis of said relation.

4,510,388

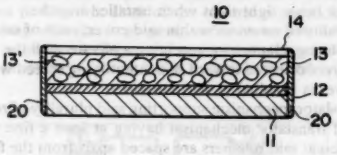
RADIATION IMAGE STORAGE PANEL

Hisashi Yamazaki, and Takeji Ochiai, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Japan

Filed Oct. 18, 1982, Ser. No. 434,885
Claims priority, application Japan, Oct. 21, 1981, 56-168141
Int. Cl.³ G03C *5/16*
U.S. Cl. 250—327.2 **11 Claims**

1. A radiation image storage panel comprising a substrate, a fluorescent layer provided on said substrate and composed of a

binder and a stimulable phosphor dispersed therein, and a protective layer provided on said fluorescent layer, characterized in that edge faces of said panel are coated with a polymer material comprising polyurethane or acrylic resin.

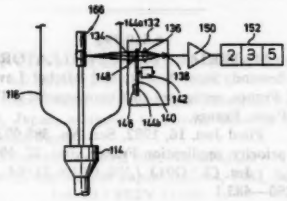


4,510,389

INFRARED FILM THICKNESS GAGE

Takabumi Fumoto, Kanagawa, Japan, assignor to Fuji Electric Company, Ltd. and Fuji Electric Corporate Research and Development, Ltd., both of, Japan

Filed Sep. 22, 1982, Ser. No. 421,323
Claims priority, application Japan, Oct. 17, 1981, 56-153463
Int. Cl.³ G01N *21/35*
U.S. Cl. 250—339 **9 Claims**



1. An infrared film thickness gage for measuring the thickness of film in a generally tubular shape during production by a film blowing process comprising a source of infrared radiation for irradiating a test film with infrared rays, a photodetector for receiving the infrared rays of reference and measurement wavelengths after the infrared rays have passed through the test film alternately, and means for converting an intensity of the received infrared rays into an electrical signal and for converting the electrical signal into an indication signal indicating film thickness, the source of infrared radiation comprising a radiating element supported only at one location and having electrical conductors attached only at the supported location to provide uniform directional distribution characteristics of radiation intensity over 360° from a region spaced from the support location and concentrically positioned in a film tube, and wherein said photodetector is positioned outside of said film tube in confronting relation to said source of infrared radiation, whereby the error in measuring the thickness of the film is no greater than about 1 μm.

4,510,390

ELECTRONIC METHOD AND APPARATUS FOR DISTANCE MEASUREMENT THROUGH THE USE OF EQUIDISTANT THERMAL FIDUCIAL MARKINGS

Jan Rajchman, 268 Edgerstoune, Princeton, N.J. 08540

Continuation-in-part of Ser. No. 338,505, Jan. 11, 1982,. This application Jun. 7, 1982, Ser. No. 385,781
Int. Cl.³ H04N *1/024*; G01J *1/00*
U.S. Cl. 250—341 **31 Claims**

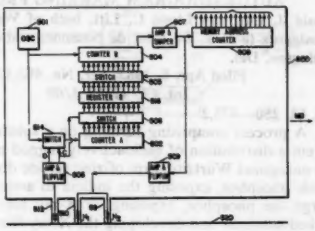
1. In a hand-holdable electronic copying apparatus that copies a document by first sweeping said apparatus across said document and, at substantially constant intervals, senses information to be copied by a plurality of optical sensors and stores said information in a memory at addresses corresponding to specific positions, and then subsequently, in a second sweep of said apparatus over the material on which the copy is to be made, energizes a plurality of writing elements in accordance with the information stored in said memory at addresses corresponding to the same relative positions of said apparatus on its first sweep, the improvement comprising:

heat producing means for hot spots on a surface;

hot spot detecting means for substantially directly contacting said surface and for detecting said hot spots produced by said heat producing means;

electronic control circuit means for controlling said heat producing means so as to produce a trail of substantially equidistant hot spots;

counter means for counting the hot spots detected by said hot spot detecting means; and,



means to address said memory according to the count in said counter means thereby causing said apparatus to accurately reproduce during said second sweep information sensed during said first sweep.

31. An apparatus for producing countable, disappearing, equidistant fiducial markings on a surface, said marking comprising hot spot areas produced one after another as said device is moved along a path over said surface, said apparatus comprising:

means for substantially directly contacting said surface and for detecting one marking by its temperature characteristics; and,

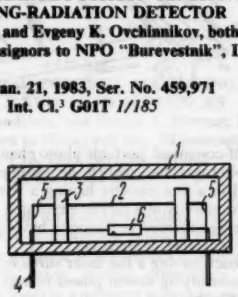
heat producing means for producing the next marking spaced apart from said detecting means by a predetermined spacing equal to the spacing between adjacent fiducial markings, said predetermined spacing being in the neighborhood of several hundred microns.

4,510,391

GAS-DISCHARGE POSITION-SENSITIVE IONIZING-RADIATION DETECTOR

Dmitry A. Goganov, and Evgeny K. Ovchinnikov, both of Leningrad, U.S.S.R., assignors to NPO "Burevestnik", Leningrad, U.S.S.R.

Filed Jan. 21, 1983, Ser. No. 459,971
Int. Cl.³ G01T *1/185*
U.S. Cl. 250—374 **4 Claims**



1. A gas-discharge position-sensitive ionizing-radiation detector comprising:

a gas-tight gas-filled housing;

an anode electrode mounted inside said housing and includ-

ing a threadlike substrate of insulating material and a layer of resistive material extending along said substrate and receiving electric charges created by ionization of gas in said housing under the influence of the ionizing radiation to be detected, said layer of resistive material having two end portions;

two electric leads attached to said housing and respectively connected to said end portions of said layer of resistive material;

a shunting resistive element connected in parallel with said layer of resistive material, the resistance of said shunting resistive element being greater than or equal to one third of the resistance between said end portions of said layer of resistive material.

4,510,392

AUTORADIOGRAM MARKING PROCESS

Gerald J. Litt, and Lloyd C. Litt, both of Wellesley, Mass., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 8, 1983, Ser. No. 483,127

Int. Cl.³ G01T *1/08*

U.S. Cl. 250—475.2 **4 Claims**

1. A process comprising forming on a substrate containing therein a distribution of radioactively tagged material indicia of a nexagonal Wurtzite form of zinc sulfide doped with trace metals phosphor, exposing the indicia to actinic radiation to charge the phosphor, exposing an X-ray film to the thusly marked substrate and developing the X-ray film to provide an X-ray film containing indicia corresponding to the phosphor ink indicia made on the substrate.

4,510,393

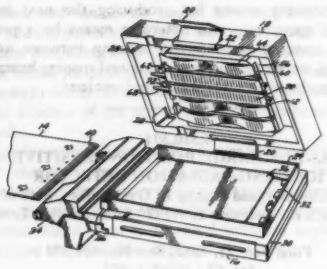
PHOTO CHAMBER FOR RECORDING CHEMICAL REACTIVITY

William J. Sell, San Francisco, Calif.; Joel M. Peisach, Madden, Mass., and David H. Riege, Newark, Calif., assignors to Mast Immunosystems, Ltd., Mt. View, Calif.

Filed Apr. 15, 1983, Ser. No. 485,172

Int. Cl.³ G01N *23/00;* **G01T** *1/167, 7/00*

U.S. Cl. 250—475.2 **4 Claims**



1. A self-contained, portable photo chamber for preparing an instant photographic record on visible-light-sensitive film contained in a film cassette having a film envelope over the film, of the activity of a carrier emitting invisible radiation, the carrier being mounted in a pipette having a flat face thereon, the photo chamber comprising:

a film back having a flat inner surface;

a flat intensifying screen joined to said flat inner surface of said film back;

instant-film processing means attached to said film back, said processing means allowing the inserting of the film cassette with the emulsion side of the film in facing relation to said intensifying screen, the withdrawing and subsequent reinserting of the envelope over the film, the withdrawing of the film cassette, and the breaking of a chemical sack containing developer chemicals as the film cassette is withdrawn;

a cover for installation to said film back, said cover and said back being light tight when installed together;

a plurality of retainers within said cover, each of said retainers being adapted for receiving a pipette with the flat face thereof oriented toward said intensifying screen when said cover is installed to said film back;

a translator mechanism supporting said plurality of retainers, said translator mechanism having at least a first position whereat said retainers are spaced apart from the film, and a second position whereat said retainers are positioned adjacent the film so that the flat faces of the pipettes in said retainers are pressed against the side of the film not having an emulsion, said translator mechanism having a control extending externally to said cover to move said retainers between the first and second positions, whereby said retainers may be moved to the first position to allow the withdrawing of the envelope over the film, moved to the second position to expose the film, and again moved to the first position to allow reinserting of the envelope over the film and withdrawing and processing of the film cassette; and

biasing means for urging the entire length of the pipettes into contact with the film with said translator mechanism in the second position.

4,510,394

MATERIAL FOR SCINTILLATORS

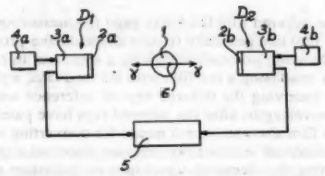
Robert Allemand, Saint Ismier, and Michel Laval, Grenoble, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Jun. 16, 1982, Ser. No. 388,992

Claims priority, application France, Jun. 23, 1981, 81 12314

Int. Cl.³ G01J *1/58;* **G01N** *21/64*

U.S. Cl. 250—483.1 **5 Claims**



1. A very fast scintillator for the detection of high energy photons, said scintillator being comprised of barium fluoride material, said material being transmissive to light at least in the wavelength range of 2000 Å to 2500 Å, said material being excited by said high energy photons to emit a first component and a second component of light, said first component being a slow component and having a wavelength above 2500 Å, said second component being a fast component in the wavelength range of 2000 Å to 2500 Å with a time constant of 0.8 ns.

4,510,395

DOUBLE-AXLE DRIVE FOR ELECTRIC SELF-PROPELLED RAILWAY VEHICLE

Christian Sohrt, Berlin, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Sep. 30, 1982, Ser. No. 429,866

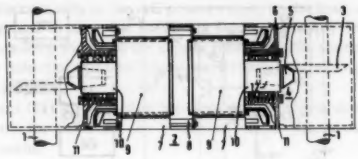
Claims priority, application Fed. Rep. of Germany, Oct. 8, 1981, 3140167

Int. Cl.³ B61C *17/00*

U.S. Cl. 290—3 **4 Claims**

1. In a longitudinal double-axle drive for an electric, track-bound, self-propelled vehicle which includes an electric pro-

pulsion motor longitudinally disposed between two drive axles of the vehicle, an angle transmission for each axle including a large gear elastically coupled to each axle and a pinion gear connected to the rotor shaft of the electric propulsion motor and meshing with the large gear, and a transmission housing for each angle transmission, the improvement comprising the electric propulsion motor being a double motor with two



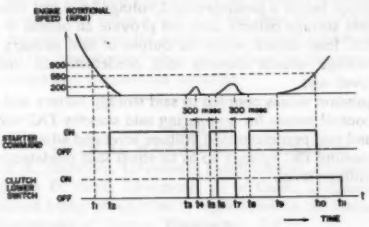
electrically independent rotors of equal length and a common stator comprised of two separate stator lamination stacks of correspondingly equal length and a continuous stator winding, and support means including a pair of overhung arrangements for separately and completely supporting each rotor, on a side thereof facing its associated transmission, from the respective transmission housing, each pinion gear being rigidly attached to a respective one of said two electrically independent rotors.

4,510,396

METHOD OF CONTROLLING AUTOMATIC STOP AND RESTART OF AN ENGINE

Shigekatsu Uchida; Takao Akatsuka, and Takahide Kawamura, all of Aichi, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Jul. 2, 1982, Ser. No. 394,728
Claims priority, application Japan, Jul. 24, 1981, 56-115990
Int. Cl.³ F02N *11/08*
U.S. Cl. 290—30 R **6 Claims**



1. Method of controlling automatic stop and restart of an engine of a motor vehicle, wherein said method comprises the steps of:

(a) detecting operating conditions of various components of said motor vehicle;

(b) judging as to whether or not first predetermined conditions for automatic engine stop are fulfilled based on detected operating conditions;

(c) judging as to whether or not second predetermined conditions for automatic engine restart are fulfilled based on detected operating conditions, said second predetermined conditions including a restarting operation;

(d) automatically stopping said engine when said first predetermined conditions are fulfilled;

(e) generating a starter command when an engine rotational speed is lowered to reach a first predetermined value, said starter command being discontinued to be generated when the engine rotational speed is increased to reach a second predetermined value;

(f) feeding the engine start signal to a starting means when a judgement is made that the second predetermined conditions are fulfilled druing said starter command being generated;

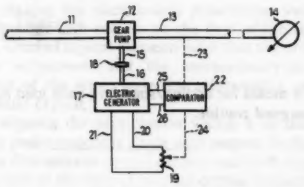
(g) masking said starter command for a predetermined period of time in synchronism with interruption of said restarting operation.

4,510,397

POLYMER FLOW CONTROL APPARATUS

Donald E. Schroeder, Jr., Littleton, Colo., assignor to Marathon Oil Company, Findlay, Ohio

Filed Jul. 20, 1983, Ser. No. 515,407
Int. Cl.³ F03B *13/00*; H02K *7/18*
U.S. Cl. 290—43 **7 Claims**



3. A method for controlling the flow of aqueous partially hydrolyzed polyacrylamide solutions of the type employed as drive fluids and/or mobility control agents in the recovery of oil from subterranean oil-bearing reservoirs to prevent shear degradation of the polyacrylamide prior to introducing the solution into an input well of an oil-bearing reservoir: comprising the steps of diluting the aqueous partially hydrolyzed polyacrylamide solution to provide a concentration of the partially hydrolyzed poplyacrylamide in the solution sufficient to enable the solution to substantially meet the permeability requirements of the oil-bearing reservoir; passing the diluted solution at one fluid pressure through flow control means to effect a lowering of the fluid pressure of the solution while at the same time extracting from the flow control means the mechanical energy resulting from the lowering of the fluid pressure of the solution; converting the mechanical energy extracted from the flow control means to electrical energy; and utilizing a portion at least of the electrical energy to regulate the rate at which the solution passes through the flow control means so as to minimize any shear degradation of the partially hydrolyzed polyacrylamide as it undergoes a change in fluid pressure.

4,510,398

ADD/SHED LOAD CONTROL ACCORDING TO MULTIPLE ADD/SHED SEQUENCES

Charles H. Culp, Mundelein, and Denise J. Downar, Palatine, both of Ill., assignors to Honeywell Inc., Minneapolis, Minn.

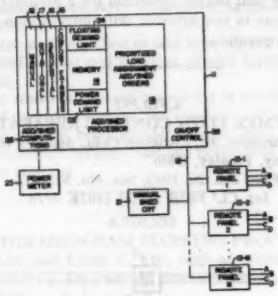
Filed Dec. 13, 1983, Ser. No. 561,002
Int. Cl.³ H02J *3/14*
U.S. Cl. 307—35 **17 Claims**

1. An add/shed system for adding/shedding loads to maintain a building's power consumption below a predetermined level, each load being assigned to at least one of multiple types of add/shed routines, each routine controlling the adding/shedding of said loads in a different sequence, said system comprising:

a plurality of loads; and,

processor means connected to said plurality of loads and adapted to be connected to a power meter for determining which of said plurality of loads should be added/shed to maintain power consumption below said predetermined

level and for determining which type of the multiple types of add/shed routine is assigned to each load, said processor means for adding/shedding each load according to its assigned routine.

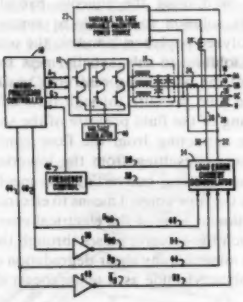


4,510,399

DEMODULATOR CIRCUIT FOR PARALLEL AC POWER SYSTEMS

Donal E. Baker, Elida, Ohio, assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 7, 1982, Ser. No. 433,325
Int. Cl.³ H02V 3/16
U.S. Cl. 307—57 **22 Claims**



1. A demodulator circuit comprising:

a first input terminal for receiving a first time varying electrical signal whose waveform is subject to variation;

a second input terminal for receiving a first pulse wave control signal;

means for switching said first time varying signal to a first output terminal when said first pulse wave control signal is at a first predetermined voltage level, thereby producing a voltage on said first output terminal which is representative of the real component of said first time varying signal;

a third input terminal for receiving a second pulse wave control signal being phase displaced from said first pulse wave control signal by 90°; and

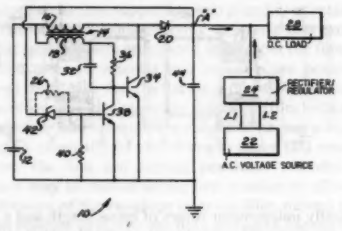
means for switching said first time varying signal to a second output terminal when said second pulse wave control signal is at a second predetermined voltage level, thereby producing a voltage on said second output terminal which is representative of the reactive component of said first time varying signal.

4,510,400

SWITCHING REGULATOR POWER SUPPLY

Kenneth J. Kiteley, Schaumburg, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 12, 1982, Ser. No. 407,417
Int. Cl.³ H02J 9/06
U.S. Cl. 307—66 **9 Claims**



1. A power supply circuit for driving a DC load device comprising:

a primary DC voltage source subject to interruptions in operation coupled to an input terminal of said DC load device for providing power thereto; and

a standby DC voltage source coupled to said input terminal for providing power to said load device during interruptions in the operation of said primary DC voltage source, said standby DC voltage source including:

a charged storage battery for generating a standby DC voltage;

self-oscillating control means responsive to the output voltage of said primary DC voltage source and coupling said storage battery to said DC load device for increasing the DC output voltage therefrom and providing said standby DC voltage to said DC load device when the output of said primary DC voltage source drops below a predetermined voltage level and wherein said storage battery does not provide an output to said DC load device when the output of said primary DC voltage source exceeds said predetermined voltage level; and

regulation means coupled to said storage battery and said control means for comparing said standby DC voltage and said predetermined voltage level and adjusting said standby DC voltage so as to equal said predetermined voltage level.

4,510,401

PROCESSES AND DEVICES FOR PROVIDING A LOAD WITH AN ELECTRIC AC SUPPLY WITHOUT DISCONTINUITY OF THE AC SIGNAL

Michel Legoult, Dammarie les Lys, France, assignor to Etablissements-Pierre Fontaine, Chilly Mazarin, France

Filed Mar. 28, 1983, Ser. No. 479,179
Int. Cl.³ H02J 9/06
U.S. Cl. 307—66 **11 Claims**

3. An electric supply device capable of delivering AC electric energy to a load without interruption, comprising

a transformer (1) having a secondary assembly connectable to the load to be supplied,

first means (13,14) for connection to a main AC electric source, these first connection means being connected to the primary assembly of the transformer,

second means (15,16) for connection to an auxiliary DC electric source, these second means being connected to power oscillator means (18,19) themselves connected to the primary assembly of the transformer,

means (22) for detecting a failure of the main source,

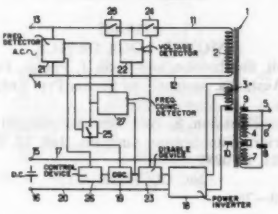
control means (23,24), made dependent on said detecting means, for selectively controlling the power supply of the

primary assembly of the transformer either from the main source when this latter is in the operating condition, or from the auxiliary source when the main source is broken down (cut off),

and synchronizing means associated with said control means for synchronizing the switching of the supply from one source to the other so that there results therefrom no discontinuity in the AC power supply to the load, characterized in that, for switching from the supply from the auxiliary source to the supply from the main source when a failure of this latter disappears, the synchronizing means comprise:

means (21) for detecting the frequency of the main source,

means for detecting the frequency of the power oscillator means,



means (26) for controlling the frequency drift of the power oscillator means (18,19), these frequency drift controlling means being under the dependence of the means (21) for detecting the frequency of the main source,

means (27) for detecting the coincidence of the frequencies of the main source and of the power oscillator means,

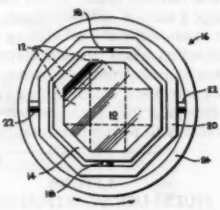
and synchronous switch means (28) placed under the control of said frequency coincidence detection means, for disconnecting the main source from the primary assembly of the transformer when a failure of the main source occurs and for reconnecting the main source to the primary assembly of the transformer when said failure has disappeared and when said frequencies coincide.

4,510,402

OPTICAL HARMONIC GENERATOR

Mark A. Summers, Livermore; David Elmerl, Pleasanton, and Robert D. Boyd, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jun. 10, 1982, Ser. No. 387,060
Int. Cl.³ G02F 1/35
U.S. Cl. 307—427 **14 Claims**



1. An optical frequency generator in the path of a fundamental frequency input wave, said generator selectively passing a fundamental frequency output wave, generating a second-harmonic frequency output wave or generating a third-harmonic frequency output wave in response to the fundamental frequency input wave, the input wave having a propagation vector k and an electric-field polarization vector, comprising:

first and second serially arranged birefringent uniaxial crystal elements, each having an optic axis, ordinary and extraordinary directions;

means for fixedly positioning said uniaxial crystal elements into an integral assembly with the crystal elements oriented so that the ordinary polarization direction of the first uniaxial crystal element is parallel with the extraordinary polarization direction of the second uniaxial crystal element and so that the extraordinary direction of the first uniaxial crystal element is parallel to the ordinary direction of the second uniaxial crystal element, said fixedly positioning means providing for said elements to move together as a single unit and to be mounted closely adjacent together;

means for aligning the electric-field polarization vector of the input wave with respect to the first of the serially-arranged uniaxial crystal elements such that the ordinary-direction component and the extraordinary-direction component of the input wave are substantially equal in each uniaxial crystal;

means for aligning the propagation vector k of the input wave at a phase-matching angle with respect to the optic axis of the first uniaxial crystal element and with respect to the optic axis of the second uniaxial crystal elements such that quadrature second-harmonic output waves are produced by the first and second uniaxial crystal elements when a fundamental input wave of sufficient intensity irradiates the integral assembly;

wherein the means for aligning the electric-field polarization vector of the input wave with respect to the first unaxial crystal element is adjustable such that the ordinary-direction component and the extraordinary-direction component in the first uniaxial crystal element are provided in the ratio of two-to-one so that the first uniaxial crystal element produces second-harmonic frequency waves having an electric-field polarization vector parallel to the ordinary direction of the second uniaxial crystal element;

wherein the means for aligning the propagation vector k of the input wave at a phase-matching angle with respect to the optic axis of the second uniaxial crystal element is adjustable such that the second-harmonic wave and the residual fundamental wave from the first uniaxial crystal element mix in the second uniaxial crystal element to generate a third harmonic wave when a fundamental input wave of sufficient intensity is provided;

wherein the means for aligning the propagation vector k of the input wave at a phase-matching angle with respect to the optic axis of the first and second uniaxial crystal elements is variably adjustable for controlling the amount of phase-matching for each crystal element to selectively control the amount of second-harmonic generated in each crystal for providing an elliptically-polarized second-harmonic output wave; and

wherein the means for aligning the propagation vector k of the input wave is adjustable to pass the fundamental wave through the crystal elements and wherein the means for aligning the electric-field polarization vector of the fundamental wave is adjustable to obtain a selected degree of elliptical polarization state after passage through the birefringent uniaxial crystal elements.

4,510,403

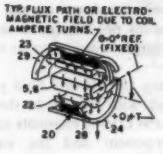
LIMITED ANGLE TORQUE MOTOR WITH MAGNETIC CENTERING AND STOPS

Robert D. Vanderlaan, and Richard Grau, both of Kalamazoo, Mich., assignors to Pneumo Corporation, Boston, Mass.

Filed Feb. 13, 1984, Ser. No. 579,784
Int. Cl.³ H02K 33/00
U.S. Cl. 310—36 **30 Claims**

1. A limited angle torque motor comprising a rotor assembly and a stator assembly surrounding said rotor assembly, said

rotor assembly and stator assembly being mounted for relative rotation, said rotor assembly including a permanent rotor magnet magnetized in the diametrical direction, and said stator assembly including a pair of circumferentially spaced axially extending stator magnetic poles having magnetic flanges at opposite ends thereof, a stator coil extending circumferentially around said stator magnetic poles, an outer magnetic housing surrounding said stator coil, said magnetic flanges extending radially outwardly toward said outer magnetic housing, said stator coil when energized by direct or pulse width modulated



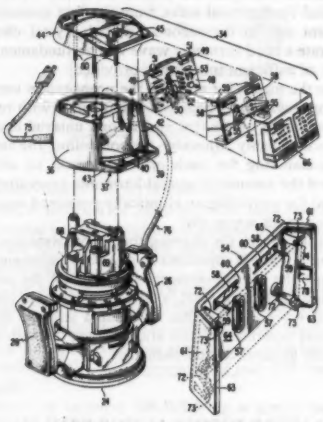
current providing a cross flux between said stator assembly and rotor magnet which causes said rotor shaft to rotate through a limited rotational angle range, and air gap means in the flux path between said outer magnetic housing and said stator magnetic poles which causes the magnetic flux produced by said permanent rotor magnet to follow a path from said permanent rotor magnet through said stator magnetic poles that produces a magnetic reluctance torque having a strong tendency to center said rotor shaft at the midpoint of such limited rotational angle range.

4,510,404

MOUNTING FOR ELECTRONIC CIRCUIT BOARD IN POWER HAND TOOL

Michael E. Barrett, Easley; Randy G. Koon, Pickens, both of S.C., and Thomas C. Laughon, Alpharetta, Ga., assignors to The Singer Company, Stamford, Conn.

Filed Mar. 31, 1983, Ser. No. 480,982
Int. Cl.³ H02K *7/14*
U.S. Cl. 310—50 **7 Claims**



1. In a power hand tool, a mounting arrangement for an electronic control comprising:

a printed circuit board carrying electronic components thereon to implement said electronic control;

a bezel fabricated from an insulating material and formed with stand off ribs extending substantially normal thereto, said stand off ribs having rabbetted surfaces spaced apart to receive said printed circuit board, means for selectively retaining said printed circuit board on said rabbetted surfaces of said stand off ribs of said bezel;

a support housing of said power tool fabricated from an insulating material, said support housing as carried on said power tool having an outwardly directed opening therein, means on said opening for supporting an edge portion of said bezel in the interior of said housing with said printed circuit board in said support housing;

a cap fabricated from an insulating material and covering with said bezel said opening in said support housing, means on said cap for sustaining the remaining edge portion of said bezel in the interior of said cap; and,

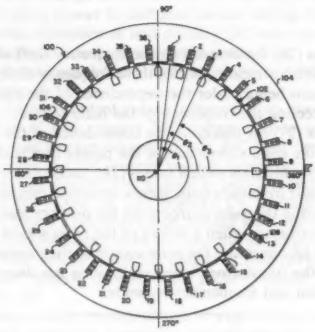
means for retaining said cap, bezel and support housing in an assembled condition to said power hand tool.

4,510,405

MOTOR LOCK DEVICE

Noel Carroll, Sherbrooke, and Colin J. Phelps, Fountain Gate, both of Australia, assignors to Secton Pty. Ltd., Dandenong, Australia

Filed Jun. 8, 1982, Ser. No. 386,180
Claims priority, application Australia, Jun. 12, 1981, PE9276; Sep. 30, 1981, PF0980
Int. Cl.³ H02K *1/10*
U.S. Cl. 310—76 **4 Claims**



1. An electric motor having a locking device for an output shaft, said locking device comprising a clutch element mounted to the output shaft by means permitting the clutch element to move axially relative to the shaft whilst constraining the clutch element to rotate with the shaft when the shaft rotates in one direction but permitting the shaft to rotate freely relative to the clutch element when the shaft rotates in the other direction, resilient means axially biasing the clutch element to engage a surface of the motor to lock the clutch element against rotation thereby preventing rotation of the shaft in said one direction whilst permitting rotation thereof in said other direction and electromagnet means selectively energizable to axially move the clutch element relative to the shaft whereby to disengage the clutch element from said surface of the motor whereby to permit free rotation of said shaft.

4,510,406

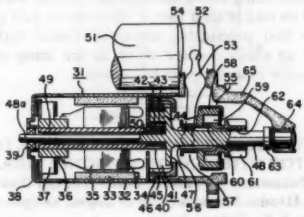
MULTI-USE STARTING DEVICE

Akira Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 26, 1984, Ser. No. 574,260
Claims priority, application Japan, Feb. 4, 1983, 58-15561[U]
Int. Cl.³ H02K *7/10*
U.S. Cl. 310—99 **3 Claims**

1. A starting device in combination with an internal combustion engine and a mechanical load comprising:

a cylindrical driving shaft;
a front bracket;
a rear bracket;
an armature of a D.C. motor supported on the outer periphery of said cylindrical driving shaft;
a rotary output shaft placed contiguous to one end of said cylindrical driving shaft and extending in alignment therewith, wherein a free end of said rotary output shaft is supported by a bearing means fitted to said front bracket;
a slidable overrunning clutch operatively associated with said rotary output shaft through a spline structure;
a speed reduction means for reducing revolution of said cylindrical driving shaft to transmit power from said cylindrical driving shaft to said rotary output shaft;



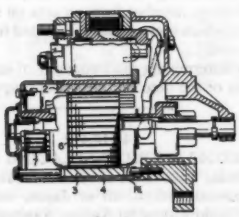
a power transmitting shaft firmly connected in alignment with said rotary output shaft and passed through said cylindrical driving shaft so as to be rotatable therein, one end of said power output shaft extended from the other end of said cylindrical driving shaft and wherein a free end of said power output shaft is supported by a bearing means fitted to said rear bracket;
a shift lever having its pivotal point set by a grommet formed in said front bracket, with one end of said shift lever operatively associated with said overrunning clutch;
first means for supplying electric power to said D.C. armature and for activating said shift lever in response to said internal combustion engine's starting requirements; and
second means for supplying power to said D.C. armature in response to mechanical load requirements.

4,510,407

PERMANENT MAGNET TYPE MOTOR HAVING IMPROVED POLE STRUCTURE

Tosio Tomite, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 9, 1983, Ser. No. 502,632
Claims priority, application Japan, Jun. 11, 1982, 57-100048
Int. Cl.³ H02K *21/26*
U.S. Cl. 310—154 **21 Claims**



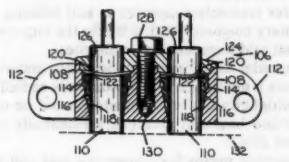
1. A permanent magnet type motor having a stator which comprises a yoke, a plurality of main magnetic poles made of permanent magnets, and a plurality of auxiliary magnetic poles, each of said main magnetic poles and each of said auxiliary magnetic poles being juxtaposed on the inner peripheral surface of said yoke to form respective pairs of juxtapsed main and auxiliary magnetic poles spaced in the circumferential direction by an air gap from other pairs of juxtaposed main and auxiliary magnetic poles, wherein each of said auxiliary magnetic poles has an axial length larger than an axial length of an armature core and smaller than an axial length of each of said main magnetic poles.

4,510,408

MOUNTING DEVICE FOR CYLINDRICAL MAGNETIC SENSOR

Raymond J. Jovick, Troy; Roger J. Malott, Union Lake, and Thomas E. Evans, Farmington Hills, all of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 734,149, Oct. 20, 1976, abandoned, which is a continuation of Ser. No. 577,243, May 13, 1975, abandoned. This application Jun. 5, 1978, Ser. No. 912,789
Int. Cl.³ H02K *21/26*
U.S. Cl. 310—168 **10 Claims**



1. A magnetic sensor mounting device for a wheel speed sensor assembly which said assembly is capable of being installed in association with a wheel rotatably mounted on an axle assembly and includes an annular rotor means mounted relative to said wheel for rotation about its axis corresponding to rotation of said wheel and a generally cylindrical magnetic sensor alignable with said annular rotor means, said magnetic sensor mounting device comprising:

a support structure for said magnetic sensor adapted to be fixedly mounted on said axle assembly in alignment with said annular rotor means;

a resilient plastic sleeve member having a generally cylindrical opening to closely receive said magnetic sensor therein, said sleeve member having an outer surface at a first end thereof which is gradually tapered inwardly;

said support structure having a first end which has an interior surface which is tapered to mate with said outer surface of said first end of said magnetic sensor;

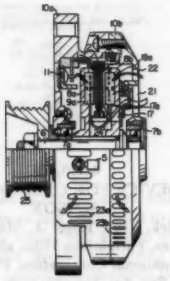
said support structure including means for selectively applying an axial force to said sleeve member when said magnetic sensor is positioned at a predetermined axial location therein to cause said first end of said support structure to inwardly wedge said first end of said sleeve member against said magnetic sensor to produce frictional contact therebetween; and

said resilient plastic sleeve member being generally noncompressible to cause only said first end thereof to be deformed inwardly against said magnetic sensor to produce said frictional contact therebetween.

4,510,409
HEAT INSULATION AND HEAT DISSIPATION CONSTRUCTION FOR FLAT ELECTRIC ROTARY MACHINE

Kenji Kanayama, Kariya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Aug. 12, 1983, Ser. No. 522,737
Claims priority, application Japan, Sep. 28, 1982, 57-169220; Oct. 6, 1982, 57-174648; Jan. 21, 1983, 58-8245
Int. Cl.³ H02K 1/32, 9/06
U.S. Cl. 310—268 4 Claims

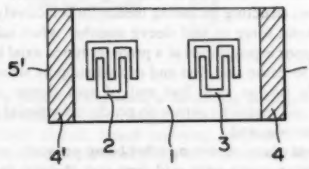


1. An electric rotory machine in flat discoidal form as a whole, comprising:
an armature coil secured to a housing of said electric rotory machine; and
a rotor rotatably supported in said housing for producing a rotary magnetic field; wherein the improvement resides in that said armature coil comprises:
a discoidal base formed of insulating material and provided with a multiplicity of substantially radially arranged slits,
a multiplicity of coil segments located on opposite surfaces of said base and arranged substantially radially between said slits,
connecting means for connecting said coil segments to said base, said connecting means including inner rings and outer rings located along inner and outer peripheral edges of the base respectively with open spaces left between radially inward ends of said coil segments and said inner rings and between radially outward ends of said coil segments and said outer rings respectively, and with resilient material interposed between said inner and outer rings and said coil segments.

4,510,410
ELASTIC SURFACE WAVE ABSORBERS COMPRISING ULTRAVIOLET LIGHT CURABLE RESIN

Akitsuna Yuhara, Yokohama; Kazuo Nate, Machida; Tatsuro Toyama, Kanagawa, and Jun Yamada, Yokohama, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 24, 1983, Ser. No. 507,463
Claims priority, application Japan, Jul. 7, 1982, 57-116791
Int. Cl.³ H03H 9/25
U.S. Cl. 310—313 D 15 Claims

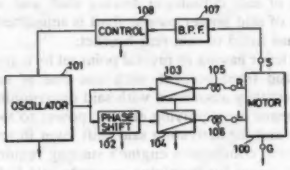


1. An elastic surface wave device comprising a piezoelectric substrate, at least one pair of transmitting and receiving electrodes on the surface of said substrate, and elastic surface wave absorbers formed by curing a composition, the main component of which is a resin curable by ultraviolet radiation, disposed on at least part of the zone on said piezoelectric substrate that propagates unwanted elastic surface waves, wherein said composition used to form said elastic surface wave absorbers comprises at least one photopolymerizable resin selected from the group consisting of 1,2-polybutadiene resin with terminal acryloyloxy or methacryloyloxy groups, organopolysiloxanes with terminal acryloyloxy or methacryloyloxy groups, epoxyacrylate-based resin, unsaturated polyester resins, and unsaturated urethane resin, an addition-polymerizable monomer having at least one $CH_2{=}C$ group and a boiling point at normal pressure of not less than 100° C., and a photosensitizer, said composition being used to form single surface wave absorbers, disposed on said at least part of the zone on said piezoelectric substrate that propagates unwanted elastic surface waves, whereby an elastic surface wave device using single elastic surface wave absorbers can be provided.

4,510,411
DRIVE CIRCUIT FOR SURFACE-WAVE DRIVEN MOTOR UTILIZING ULTRASONIC VIBRATION

Kazuo Hakamata, Kawasaki; Tadao Takagi, Yokohama, and Yukio Hyodo, Hiratsuka, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Apr. 30, 1984, Ser. No. 605,693
Claims priority, application Japan, May 4, 1983, 58-77380
Int. Cl.³ H01L 41/08
U.S. Cl. 310—316 10 Claims



1. A surface-wave driven motor comprising:
a moving member for being displaced;
a resilient member having a surface urged against said moving member;
a piezo-electric member provided in contact with said resilient member to impart vibration to said resilient member and create an elastic wave in said surface;
means having electrode means provided on said piezo-electric member and applying an AC voltage to said piezo-electric member through said electrode means;
means for detecting an electrical output produced in said piezo-electric member from an area on said piezo-electric member which is electrically insulated from said electrode means; and
means for determining the frequency of said AC voltage on the basis of the detected electrical output.

4,510,412
PIEZOELECTRIC DISPLACING DEVICE

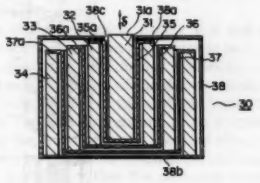
Yoshiyuki Suda, Yokohama; Katsunori Yokoyama, Ebina, and Chiaki Tanuma, Tokyo, all of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Sep. 2, 1983, Ser. No. 528,841
Claims priority, application Japan, Sep. 3, 1982, 57-152554
Int. Cl.³ H01L 41/08
U.S. Cl. 310—328 6 Claims

1. A piezoelectric displacing device comprising:
displacing means including a plurality of displacing members each including a plurality of stacked longitudinal effect type piezoelectric elements, said piezoelectric elements in

each displacing member being stacked such that displacement axes thereof are in the same direction, said displacing members being arranged juxtaposed to each other in a direction normal to the displacement axes of said piezoelectric elements and converting a voltage applied thereto to a mechanical displacement; and

a plurality of connecting means for mechanically connecting adjacent displacing members in series with each other, each of said connecting members having a first member extending parallel to said displacement axes and arranged



between said adjacent displacing members, a second member extending from said first member to one of said adjacent displacing members and a third member extending from said first member to the other of said adjacent displacing members, second and third members being connected at different positions along the displacement axis of said adjacent displacing members for deriving a sum of amounts of displacement of said piezoelectric displacing members along the displacement axes thereof to give an amount of displacement of said device.

4,510,413

ELECTRODE STRUCTURE FOR ELECTRON GUN

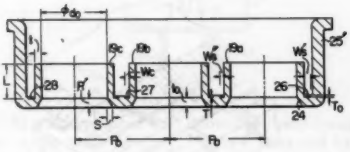
Minoru Yabe; Kenichi Noda; Satoru Endo, all of Mobara, and Masaaki Yamauchi, Tohgane, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Feb. 9, 1980, Ser. No. 214,693

Claims priority, application Japan, Jan. 18, 1980, 55-3471

Int. Cl.³ H01J *29/46*

U.S. Cl. 313—460 **15 Claims**



1. An electrode structure for an electron gun, having three closely arranged hollow cylindrical members extending in parallel from a base plate having apertures in alignment with respective cylindrical members, the base plate and the cylindrical members being formed integrally, wherein the inner edge of the bottom portion of each of said hollow cylindrical members is provided with a tapering surface having a precise circular cross section which is concentric with the centers of said apertures, whereby there is obtained a predetermined concentricity of said apertures with respect to the axes of said respective cylindrical members.

4,510,414

ELECTRON EXCITED FLUORESCENT DISPLAY DEVICE INCLUDING SCREEN WITH RARE EARTH PHOSPHOR EXHIBITING SUBLINEAR CURRENT DENSITY-EMISSION LUMINANCE CHARACTERISTICS

Sigeo Fujino, Hiratsuka; Takashi Hase, Ebina, and Akio Toshinai, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Japan

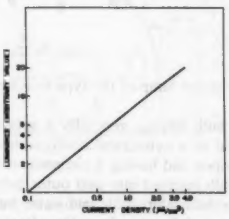
PCT No. PCT/JP82/00286, § 371 Date Mar. 9, 1983, § 102(e) Date Mar. 9, 1983, PCT Pub. No. WO83/00342, PCT Pub. Date Feb. 3, 1983

PCT Filed Jul. 23, 1982, Ser. No. 474,600

Claims priority, application Japan, Jul. 23, 1981, 56-115663; Aug. 13, 1981, 56-127104

Int. Cl.³ H01J *29/20, 29/26;* C09K *11/08*

U.S. Cl. 313—468 **9 Claims**



1. An electron excited fluorescent display device including a fluorescent screen, and comprising, as the main part of the fluorescent screen, a rare earth yellow to red emitting phosphor represented by the following general formula:

$$(Ln_{1-x-y}Eu_xCe_y)_2O_2S$$

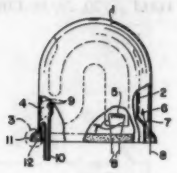
in which Ln is at least one of yttrium, gadolinium, lanthanum and luetetium, x is a number satisfying $10^{-4} \leqq x \leqq 9 \times 10^{-2}$, and y is a number satisfying $10^{-6} \leqq y \leqq 2 \times 10^{-3}$, and exhibiting sublinear current density-emission luminance characteristics when current density of an excitation electron beam is increased, said electron excited fluorescent display device being a current modulation type multi-color cathode ray tube provided with at least one current modulation electron gun for changing the current density of the electron beam emitted therefrom, a non-pattern fluorescent screen positioned in an advancing direction of said electron beam so as to stand face to face with said current modulation electron gun, and a deflecting coil or coils for generating a magnetic field in a direction normal to the advancing direction of said electron beam, deflecting said electron beam, and causing the entire surface of said non-pattern fluorescent screen to be excited by said electron beam and to emit light, and said non-pattern fluorescent screen comprising a yellow to red emitting phosphor as defined above exhibiting the sublinear current density-emission luminance characteristics when the current density of said electron beam is increased, and a phosphor exhibiting an emission color different from said yellow to red emitting phosphor and exhibiting superlinear or linear current density-emission luminance characteristics when the current density of said electron beam is increased.

4,510,415

FLUORESCENT LAMP AND PROCESS FOR FABRICATING THE SAME

Yoshiro Ogata, Osaka; Haruo Yamazaki, Shiga, and Hidezoh Akutsu, Hyogo, all of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Continuation of Ser. No. 263,575, May 14, 1981, Pat. No. 4,423,350. This application Oct. 6, 1983, Ser. No. 539,671
Claims priority, application Japan, May 14, 1980, 55-64510
The portion of the term of this patent subsequent to Dec. 27, 2000, has been disclaimed.
Int. Cl.³ H01J *63/04, 9/00*
U.S. Cl. 313—493 **2 Claims**



1. A fluorescent lamp of the type in which a lamp envelope comprises:

an outer bulb having generally a spherical or a partially spherical or a cylindrical configuration with a generally planar open end having a circumferential end portion, an inner bulb inserted into said outer bulb in predetermined nested relationship with said outer bulb, said inner bulb having a peripheral end portion adjacent the circumferential end portion of said outer bulb, and a stem or a circular sealing disk adapted to close the open end of said outer bulb;

either the inner surface of said outer bulb or the outer surface of said inner bulb being formed with a groove which defines a discharge groove between said outer and inner bulbs;

a phosphor formed at least over the wall surfaces of said groove on either the inner surface of the outer bulb or the outer surface of the inner bulb;

an electrode disposed at each end of said discharge groove; and

a radiation emitting discharge gas consisting of mercury gas vapor and a rare gas or a rare gas mixture filled in said discharge groove,

wherein

the circumferential end portion of said outer bulb is flared radially outwardly so that glass frit can be filled in the annular space defined between the radially outwardly flared circumferential end portion of said outer bulb and the periphery of said stem or said circular sealing disk, whereby the radially outwardly flared circumferential end portion of said outer bulb and the periphery of said stem or said circular sealing disk can be gas-tightly sealed with said glass frit when the latter is heated and then solidified.

4,510,416

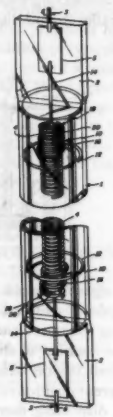
FILAMENT SUPPORT FOR TUBULAR LAMP

Steven L. Meade, Winchester; Merle E. Morris, and Lawrence M. Rice, both of Lexington, all of Ky., assignors to GTE Products Corporation, Stamford, Conn.

Filed Jul. 21, 1983, Ser. No. 515,745
Int. Cl.³ H01K *1/14*
U.S. Cl. 313—579 **10 Claims**

1. In an electric incandescent lamp of the double-ended type including a tubular envelope sealed at each end thereof, a helically coiled filament extending longitudinally through the interior of said envelope, and lead-in conductor means located at each of said sealed ends of said tubular envelope and extending exteriorly thereof, the improvement comprising;

a filament support in the form of a wire having a first end portion extending in a loop which is circumferentially engageable with the inner wall of said envelope around at least one-half of the circumference thereof, a second end portion extending substantially axially of said envelope and defining an inner power lead conductively coupled to



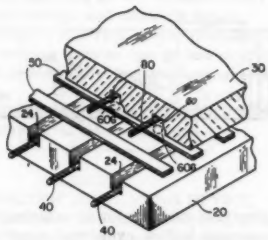
one of said lead-in conductor means, a third portion adjacent said first portion and defining at least one coil of outer diameter less than the diameter of said first portion loop and having an inner diameter dimensioned to snugly receive an end of said helically coiled filament, and a fourth portion disposed intermediate said second and third portions and having a turned section forming an abutment for limiting the position of said filament relative to said filament support.

4,510,417

SELF-SCAN GAS DISCHARGE DISPLAY PANEL

Edgar L. Harvey, Jamesburg, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 2, 1983, Ser. No. 490,496
Int. Cl.³ H01J *17/49*
U.S. Cl. 313—585 **2 Claims**



1. A display panel comprising

a gas-filled envelope made up of a base plate and a face plate sealed together hermetically,

a plurality of parallel, longitudinal scan slots formed in the top surface of said base plate, there being a land between adjacent slots,

a scan anode secured in each of said scan slots,

a plurality of cathodes in the form of strips, each having a

top surface and a bottom surface, seated parallel to each other adjacent to the top surface of said base plate and oriented transverse to said scan anodes so that each crossing of a cathode with the scan anodes forms a scan cell made up of the scan anode and the lower surface of the cathode above it,

an array of depressions formed in the lower surface of said base plate inside said envelope, there being one depression for each scan cell, the depressions being arrayed in rows and columns,

a plurality of parallel, longitudinal display slots in the lower surface of said face plate, said display slots being parallel to said scan slots and extending along and through the rows of depressions, and

a display anode secured in each display slot and oriented parallel to the scan anodes and transverse to said cathodes so that each crossing of said display anodes by a cathode forms a display cell made up of the display anode and the portion of the top surface of the cathode beneath it,

said display slots and said depressions being oriented along and overlying the lands between the scan slots, and said depressions overlying cathode electrodes, said depressions being smaller in diameter than the cathodes are wide,-

said panel being operated by turning on said scan cells column-by-column and generating cathode glow between the scan cathodes and the lower surface of each cathode and simuntaneously energizing selected display anodes to cause glow to transfer from a scan cell along the edge of a cathode and onto the top surface of the cathode beneath a selected display anode where the glow remains.

4,510,418

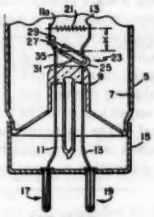
RAPID START FLUORESCENT LAMP WITH A BIMETAL ELECTRODE DISCONNECT SWITCH

John W. Anderson, Jr., Ipswich, and William J. Roche, Merrimac, both of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Continuation-in-part of Ser. No. 632,262, Jul. 18, 1984, abandoned, which is a continuation of Ser. No. 546,072, Oct. 27, 1983, abandoned, which is a continuation-in-part of Ser. No. 494,841, May 16, 1983, abandoned. This application Aug. 28, 1984, Ser. No. 644,905

Int. Cl.³ H01J *7/44, 17/34, 19/78, 29/96*

U.S. Cl. 315—73 **11 Claims**



1. A 40-watt type rapid start fluorescent lamp operable at a current in the range of about 350 to 475 ma and having an envelope with a phosphor-coated inner wall surface, a low pressure fill gas, an electrode within each end of the envelope and a pair of electrically conductive leads passing through each end of said envelope for coupling each of said electrodes to an energization source, said fluorescent lamp characterized by the improvement wherein an electrode disconnect switch is affixed to at least one of said pair of electrical leads associated with at least one of said electrodes within said envelope, said electrode disconnect switch including a bimetal switch operable at temperatures in the range of about 75° C. to 300° C. and normally closed at room temperature and open at a predetermined temperature higher than room temperature and spaced at least 8.0 mm from said electrode and a pair of electrical conductors coupled to said bimetal switch, one of said pair of electrical conductors of said disconnect switch connected to one of said pair of electrically conductive leads of said lamp and the other of said pair of electrical conductors of said disconnect switch connected to said electrode with the other of said pair of electrically conductive leads of said lamp coupling said electrode to said energization source.

4,510,419

GRIP-TYPE PHOTOGRAPHIC FLASH DISCHARGE DEVICE

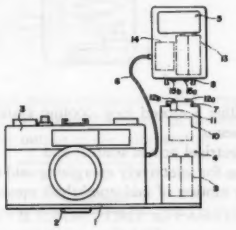
Yoshiyuki Takematsu, Tokyo, Japan, assignor to Fuji Koeki Kabushiki Kaisha, Tokyo, Japan, a part interest

Filed Jun. 17, 1983, Ser. No. 505,449

Claims priority, application Japan, Jun. 23, 1982, 57/106765

Int. Cl.³ H05B *37/00*

U.S. Cl. 315—241 P **4 Claims**



1. A grip portion type photographic flash discharge device, comprising:

a. a main discharge capacitor for storing charge with which to effect discharge of said flash device;

b. a grip portion provided with a first DC-DC converter and adapted to receive a first battery power source for activating said first DC-DC converter;

c. a flash unit provided with a second DC-DC converter and adapted to receive a second battery source for activating said second DC-DC converter, said flash unit being removably attachable to said grip portion; and

d. electrical interconnection means for connecting said first and second DC-DC converters by attachment of said flash unit to said grip portion, said main discharge capacitor being chargeable by the cooperation of said connected converters.

4,510,420

SERVO ROTARY MOTOR

Bill J. Sasso, Houston, Tex., assignor to Servo Technology Corp., Houston, Tex.

Continuation of Ser. No. 215,920, Dec. 12, 1980, abandoned, which is a continuation-in-part of Ser. No. 71,949, Sep. 4, 1979, abandoned. This application Feb. 7, 1984, Ser. No. 577,792

Int. Cl.³ H02K *33/12*

U.S. Cl. 318—37 **6 Claims**

1. A multicylinder electromagnetic engine comprising:

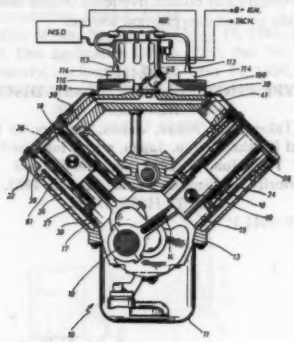
(a) an engine block including a water cooling system, a plurality of cylinders having an inner end in communication with the interior of the engine block and a crankshaft means;

(b) an engine block head having a plurality of cylindrical receptacles projecting downwardly from a bottom surface of said head, said receptacles being closed at the lower end and open at the upper end thereof and sized to be received in said cylinders;

(c) a magnetizable plunger reciprocally disposed in each of said receptacles, said plunger being operatively connected to said crankshaft means;

(d) coil means disposed in each of said receptacles;

(e) a cooling manifold in fluid communication with the water cooling system of the engine, said manifold including a plurality of fluid passages in communication with a plurality of passages formed in said engine block head



providing a closed loop cooling system for cooling said coil means;

(f) an electrical power source; and

(g) means for selectively energizing said coil means to cause rotary motion of said crankshaft means.

4,510,421

LINEAR MAGNET

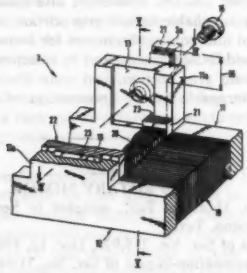
Peter Schwarzler, Fürstenfeldbruck, Fed. Rep. of Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Jul. 8, 1983, Ser. No. 512,414

Claims priority, application Fed. Rep. of Germany, Jul. 10, 1982, 3225948

Int. Cl.³ H02K *41/02*

U.S. Cl. 318—135 **10 Claims**



1. A linear stator magnet adapted to be juxtaposed with an armature rail, comprising:

a sheet stack yoke formed with a plurality of longitudinally spaced codirectionally extending sheet stack pole shanks;

respective cheek plates flanking each of said pole shanks, said pole shanks each being formed with a pole shoe remote from continuous portions of said yoke, said pole shoes having pole faces adapted to be juxtaposed with said rail;

respective yoke plates flanking said continuous portion of said yoke and overlapping said cheek plates and form and force-locked thereto;

respective main excitation coils surrounding said shanks; and

respective auxiliary excitation coils surrounding each of said pole shoes and locked in the gaps between said pole shoes while being connected in circuit with the main excitation coil to a source of excitation current.

4,510,422

DC MOTOR SOFT-START CIRCUIT

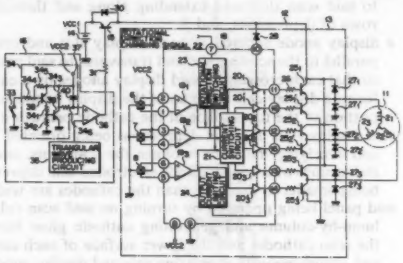
Masahiko Ogura, Fujisawa, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 6, 1984, Ser. No. 577,337

Claims priority, application Japan, Feb. 9, 1983, 58-20106

Int. Cl.³ H02P *1/18*

U.S. Cl. 318—254 **4 Claims**



1. A DC motor driving circuit comprising:

a motor having polyphase exciting coils;

a DC power supply;

an excitation current supply line for supplying excitation current from the DC power supply to the polyphase exciting coils;

exciting coil switching means connected to the excitation current supply line and the polyphase exciting coils, for sequentially switching the polyphase exciting coils;

excitation current control means for controlling the magnitude of the excitation currents to be supplied to the exciting coils; and

timing signal producing means for producing a timing signal which, when the motor is started, is supplied to the excitation current control means so as to suppress the magnitude of the excitation current, said timing signal producing means including a start switch adapted to be turned ON when the motor is started; a time constant circuit for producing a signal which is lowered from a predetermined level to a ground level during a predetermined period of time following the turning on of the start switch; a triangular wave producing circuit; and a comparator connected to receive an output signal of the time constant circuit and an output signal of the triangular wave producing circuit and supply pulses which successively decrease in their widths, to the excitation current control means.

4,510,423

MOTOR APPARATUS

Teruo Iwasawa, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 28, 1982, Ser. No. 402,726

Claims priority, application Japan, Aug. 12, 1981, 56-126359

Int. Cl.³ G05B *5/00*

U.S. Cl. 318—331 **17 Claims**

1. A motor apparatus comprising:

motor means for providing a rotating motion with a given output torque and at a given rotating speed, said motor means generating a back electromotive force with a magnitude corresponding to said rotating speed;

first means coupled to said motor means for sensing said back electromotive force to provide a first signal with a magnitude corresponding to said electromotive force;

second means coupled to said motor means for sensing the rotating motion of said motor means to provide a second

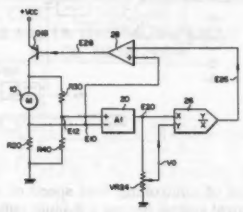
signal with a magnitude corresponding to said rotating motion;

third means coupled to said first and second means and being responsive to said first and second signals, for providing a third signal with a magnitude corresponding to said first and second signals;

said third means including:

divider means responsive to said first and second signals for dividing said second signal by said first signal to provide a divided signal representing a ratio of said first signal to said second signal; and

a first circuit having inputs coupled to said motor means and to said divider means, and for providing at an output thereof said third signal with a magnitude corresponding to a potential difference between a potential



corresponding to said back electromotive force and a potential of said divided signal; and

fourth means coupled to said motor means and to said output of said first circuit of said third means for providing a drive current to said motor means, said drive current having a magnitude corresponding to said third signal, the kinetic energy of the rotating motion of said motor means being derived from said drive current; and

wherein said motor means, said first means, said second means, said third means and said fourth means are coupled to form a negative feedback loop for setting up a proportional relationship of said second signal to the product of said rotating speed and said output torque, and said second means changes said second signal proportionally to said rotating speed.

4,510,424
NUT RUNNER CONTROL CIRCUIT

Tabito Doniwa, Hachioji, Japan, assignor to Daiichi Dentsu Kabushiki Kaisha, Chofu, Japan

Filed Sep. 8, 1983, Ser. No. 530,212
Int. Cl.³ G05D *17/00*
U.S. Cl. 318—432 **3 Claims**

1. A nut runner control circuit for controlling a nut runner comprising:

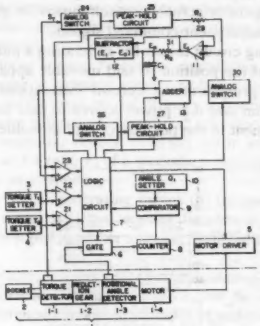
a torque detector of the nut runner for detecting a torque for tightening a screw;

a rotational angle detector coupled to the shaft of the nut runner for providing an output representative of the rotational angle of the nut runner;

memory means operatively connected to the torque detector and the rotational angle detector for temporarily storing a rate of increase in the torque in a second rotational angle during screw-tightening in an elastic region at the end of the second rotational angle and for storing the output value of the torque detector at the end of the second rotational angle;

adding means connected to the memory and the rotational angle detector for increasing the output value of the torque detector at the end of the second rotational angle at the rate of increase of torque to provide an added value from the time when a rotation of a first rotational angle neccessary for plastic region tightening has completed after the end of the second rotational angle;

a comparator connected to the adding means and the torque detector for comparing the added value of the adding means with the output value of the torque detector to provide a coincidence output when they coincide with each other;

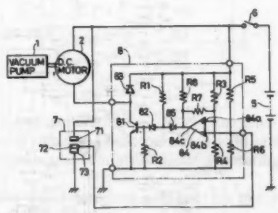


motor stop control means connected to the comparator and the nut runner for stopping a motor of the nut runner by the coincidence output of the comparator.

4,510,425
CONTROL DEVICE FOR PUMP APPARATUS FOR VEHICULAR USE

Mitsuyoshi Yokota, and Akio Matsumoto, both of Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 15, 1983, Ser. No. 552,193
Claims priority, application Japan, Nov. 15, 1982, 57-173654[U]
Int. Cl.³ G05B *13/00*
U.S. Cl. 318—484 **6 Claims**



1. A control device for a vacuum pump apparatus for vehicular use, comprising: a d.c. motor; a pump coupled to be driven by said d.c. motor for producing a negative pressure; and pressure switch means for detecting a negative pressure generated by said pump and for controlling said d.c. motor in response to the detected pressure, said pressure switch means comprising three contacts for providing driving of said d.c. motor with a hysteretic characteristic.

4,510,426
MEMORY POWER SEAT CONTROLLER

Paul A. Michaels, Livonia, and David L. Kaleita, Sterling Heights, both of Mich., assignors to Lectron Products, Inc., Rochester, Mich.

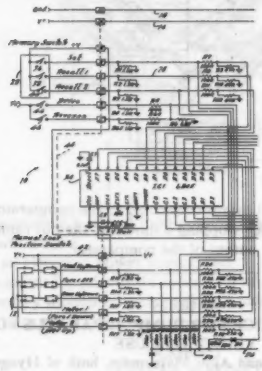
Filed Jul. 30, 1982, Ser. No. 403,530
Int. Cl.³ G05B *23/02*; H02H *3/027*
U.S. Cl. 318—565 **17 Claims**

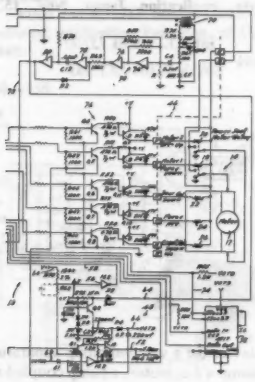
1. In a system for controlling the position of a movable

apparatus, having motive power means including at least one motor operable from a d.c. power source and adapted to adjust the position of said movable apparatus, and first operator actuable switch means for generating manual adjustment command signals, the improvement comprising:

second operator actuable switch means for generating automatic adjustment command signals;

monitoring circuit means for generating a pulse signal indicative of the position of said movable apparatus by monitoring predetermined current fluctuations in the supply line from said d.c. power source to said motor during an adjustment in the position of said movable apparatus;





memory means for storing a plurality of positions for subsequent recall in response to said automatic adjustment command signals; and

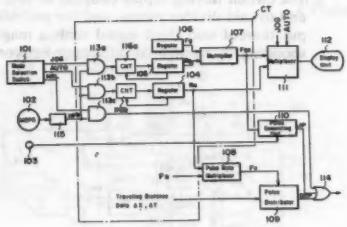
microcomputer means, interconnecting said first and second operator actuable switch means, said monitoring circuit means, said memory means and said motive power means, for tracking the position of said movable apparatus by counting the number of said pulse signals, for selectively generating control signals in response to said command signals operable to cause said motive power means to adjust the position of said movable apparatus, and for detecting a stall condition by monitoring the time between said pulse signals during an adjustment in the position of said movable apparatus.

4,510,427

METHOD AND APPARATUS FOR CONTROLLING FEED SPEED IN NUMERICAL CONTROL SYSTEM

Ryoichiro Nozawa, Tokyo; Nobuyuki Kiya, Hachioji, and Kunihiko Murakami, Hino, all of Japan, assignors to Fanuc Ltd., Minamitsuru, Japan

Filed Mar. 25, 1983, Ser. No. 478,730
Claims priority, application Japan, Mar. 29, 1982, 57-50306
Int. Cl.³ G05B *11/18*
U.S. Cl. 318—590 20 Claims



1. A method of controlling feed speed of a machine in a numerical control system having a manual pulse generator for generating pulses in response to a manual operation, wherein the numerical control system numerically controls the machine by supplying the machine with the generated pulses as feed pulses in a manual feed mode and with feed pulses corresponding to a commanded feed speed in modes other than the manual feed mode, the commanded feed speed being modified in accordance with an override quantity stored in a register, said method comprising the steps of:

(a) selectively designating a mode other than the manual feed mode;

(b) changing the override quantity, which is stored in the register, based on the pulses generated by the manual pulse generator and in accordance with the designated mode; and

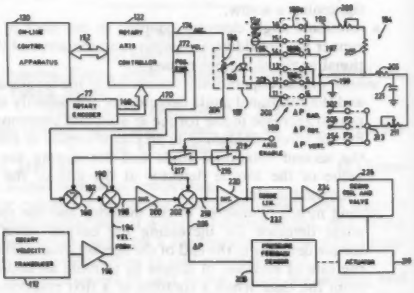
(c) modifying the commanded feed speed in accordance with the override quantity stored in the register.

4,510,428

CONTROL SYSTEM FOR MANIPULATOR APPARATUS WITH INITIALIZING STABILIZATION AND INERTIA SCALING

Maurice J. Dunne, Newtown, Conn., assignor to Unimation, Inc., Danbury, Conn.

Filed Mar. 25, 1983, Ser. No. 478,646
Int. Cl.³ G05D *23/275*
U.S. Cl. 318—632 22 Claims



1. A control system for manipulator apparatus having an arm movable in a plurality axes and including control apparatus

that provides command signals in response to program data and arm position data, said control system comprising:

means for providing a scaling signal derived from one or more of said axes and correlated to the inertial mass system of said arm;

means responsive to said command signals and said scaling signal for modifying one or more of said command signals; and

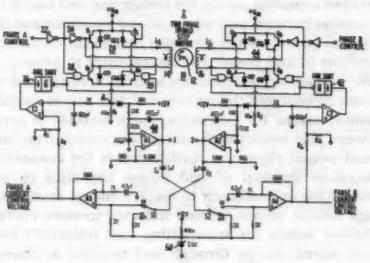
means responsive to said command signals for moving said arm in said plurality of axes.

4,510,429

STEPPER MOTOR DAMPING CIRCUIT AND A METHOD THEREFOR

John S. Squire, San Mateo, Calif., assignor to Tulin Corporation, San Jose, Calif.

Filed Aug. 19, 1983, Ser. No. 524,437
Int. Cl.³ H02K *29/04*
U.S. Cl. 318—696 **19 Claims**



1. A method of damping a stepper motor having a rotor and a first and a second stator, said method comprising the steps of:

applying a first voltage to said first stator;

detecting the total voltage from said first stator;

filtering the back voltage generated by said motor from said total voltage and

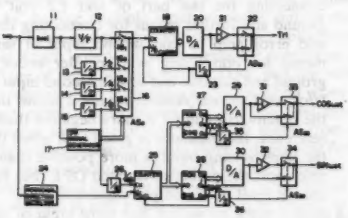
applying a drive current to said second stator to damp said motor, said drive current being proportional to said back voltage.

4,510,430

VECTOR CONTROL METHOD AND SYSTEM FOR AN INDUCTION MOTOR

Tadashi Ashikaga, Tokyo, and Masayuki Terashima, Sakura, both of Japan, assignors to Kabushiki Kaisha Meidensha, Japan

Filed Mar. 1, 1984, Ser. No. 585,599
Claims priority, application Japan, Mar. 28, 1983, 58-51906
Int. Cl.³ H02P *5/40*
U.S. Cl. 318—800 **2 Claims**



1. An induction motor decoupled vector control system, which comprises:

(a) speed sensing means (**4**) for detecting a rotor angular frequency w_r of an induction motor;

(b) proportional integrating means (**5**) for generating a primary reference current $i_{1\beta}^*$ corresponding to a secondary reference driving current on the basis of a difference between a reference rotor angular frequency w_r^* and a detected rotor angular frequency w_r in order to obtain a reference torque;

(c) supply voltage angular frequency calculating means (**6**) for calculating a primary supply voltage angular frequency w_0 on the basis of the primary reference current $i_{1\beta}^*$, a primary reference current $i_{1\alpha}^*$ corresponding to a secondary magnetic flux, a detected rotor angular frequency w_r, and a ratio τ_2 of a secondary inductance L_2 to a secondary resistance r_2;

(d) SIN/COS signal generating means (**8**) for generating a sine wave signal with an angular frequency w_0 and a cosine wave signal with an angular frequency w_0, independently;

(e) first calculating means (3D) for calculating fixed d-q coordinate primary voltages e_{1d} and e_{1q} on the basis of the primary reference currents $i_{1\alpha}^*$ and $i_{1\beta}^*$ and the sine and cosine wave signals in accordance with following expressions:

$$e_{1d}=(r_1+L_1S)\cos w_0 t\cdot i_{1\alpha}^*-(r_1+L_\sigma S)\sin w_0 t\cdot i_{1\beta}^*$$

$$e_{1q}=(r_1+L_1S)\sin w_0 t\cdot i_{1\alpha}^*+(r_1+L_\sigma S)\cos w_0 t\cdot i_{1\beta}^*$$

where r_1 denotes a primary resistance; L_1 denotes a primary inductance; L_σ denotes an equivalent leakage inductance $(L_1L_2-M^2)/L_2$ M: mutual inductance; S denotes a Laplace operator;

(f) second calculating means (7D) for calculating three-phase primary reference voltages e_a^*, e_b^*, e_c^* on the basis of the calculated 2-phase primary reference voltages e_{1d}, e_{1q} in accordance with the following expressions:

$$e_a^* = e_{1d}$$

$$e_b^* = -\frac{1}{2}e_{1d} - \frac{\sqrt{3}}{2}e_{1q}$$

$$e_c^* = -\frac{1}{2}e_{1d} + \frac{\sqrt{3}}{2}e_{1q}$$

(g) triangular signal generating means (**9**) for generating a triangular wave signal in synchronization with said SIN/-COS wave signals said triangular signal generating means including:

(1) an absolute value detecting unit (**11**) for generating a signal the voltage level of which is proportional to the magnitude of supply voltage angular frequency w_0 irrespective of the plus or minus sign thereof;

(2) a voltage-frequency converter (**12**) for converting the output of said absolute value detection unit into a signal with a frequency proportional to the output voltage level of said absolute value detection unit;

(3) a plurality of series-connected dividers (**13, 14, 15**) for dividing the frequency of the signal outputted from said voltage-frequency converter;

(4) a switching signal generator (**17**) for outputting a plurality of switching signals according to the magnitude of supply voltage angular frequency w_0;

(5) a switching unit (**16**) selectively connected to said series-connected dividers for selectively outputting the signal outputted from said voltage-frequency converter in such a way that less-times divided converter signals are outputted when the supply voltage frequency is low and many-times divided converter signals are outputted when the supply voltage frequency is high;

(6) a second up-down counter (**18**) for counting the con-

verter signals up or down repeatedly in response to carry signals generated therefrom;

(7) a third digital-analog converter (20) for converting the counted digital value into analog values corresponding thereto; and

(8) a pulse generator (37) for outputting a pulse signal with a predetermined frequency to said switching unit (16) when the supply voltage angular frequency is substantially zero or when the motor stops in order to apply an initial secondary magnetic flux; and

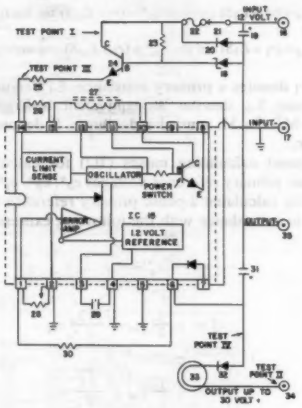
(h) PWM inverter means (2C) for generating three PWM (pulse width modulated) control signals in response to the calculated three-phase primary voltages e_a^*, e_b^*, e_c^* and the generated triangular wave signals, in order to drive a 3-phase induction motor.

4,510,431

D.C. STEPPED-UP VOLTAGE TRANSFORMERLESS BATTERY CHARGER

Harry L. Winkler, P.O. Box 632, Pinehurst, Id. 83850

Continuation of Ser. No. 163,926, Jun. 27, 1980, abandoned.
This application Feb. 25, 1982, Ser. No. 352,110
Int. Cl.³ H02J 7/00
U.S. Cl. 320—1 **1 Claim**



1. An apparatus for charging a battery from a direct current voltage source comprising:

a filter capacitor connected across the input voltage terminals with the positive lead of said capacitor connected to the positive voltage terminal of said voltage source and the negative lead of said capacitor connected to the negative terminal of said voltage source;

a two-position single-pole power switch with means for connecting said switch to be in a conductive mode when said switch is in the ON position and further means for connecting said switch to terminate the power from said voltage source when said switch is in the OFF position;

a circuit protector comprising a fuse and a first rectifier, means for connecting one end of said fuse to said power switch and means for connecting said rectifier to be poled to blow said fuse upon receiving reverse polarity of said voltage source;

an input voltage regulating system comprising a first and a second resistor, one power transistor and one zener diode, means for connecting one end of the first resistor to the cathode end of the first rectifier, to the far side of said fuse, and the collector of said transistor, further means for connecting the other end of said resistor to the base of said transistor as well as to the cathode end of said zener diode, means for connecting the anode end of said zener diode to the ground, means for connecting the emitter of said transistor in series with the second resistor and to the input of the current limiter resistor, means for controlling said regulator, the said zener diode has a pre-determined voltage break-down region upon conduction, diverts current from the base of said transistor thereby controlling said transistor's emitter voltage;

an oscillator having first, second, and third inputs and having an output, said first input of said oscillator is controlled by a first control means comprising a current limiter resistor and a current limit sense, means for connecting said current limiter resistor to said current limit sense, further means for connecting said current limit sense to said first input of said oscillator and means for said first control to turn off a power switch transistor in the switching system upon said current limit sense detecting a predetermined voltage drop across said current limiting resistor thus protecting the battery charger's circuit from an overload;

a switching system comprising a fourth resistor, said power switch transistor, an inductor, a second rectifier, and an output capacitor, means for connecting said fourth resistor in series between said output of said oscillator and the base of said power switch transistor, means for connecting the emitter of said power switch transistor to ground, means for connecting said inductor in series between said current limit resistor and the collector of said power switch transistor, means for connecting said rectifier in series between said collector of said power switch transistor and said output capacitor, further means for connecting the negative terminal of said output capacitor to ground, means for said inductor to receive energy from said voltage source, means for said inductor to store energy and further means for transmitting said inductor's received and stored energy through said rectifier to charge said output capacitor, electronic switching means having an ON-state and an OFF-state, means for connecting said electronic switch to provide a current path to load said inductor when in the ON-state condition and further means for providing said inductor a current path to charge said output capacitor with said stored energy when said electronic switch is in the OFF-state condition, in normal operation said electronic switch is cycled ON and OFF at the same rate as the frequency of said oscillator;

means for regulating the charge level of said output capacitor comprises a resistive voltage divider network comprising a fifth resistor and a potentiometer, means for connecting one end of said resistor to said output capacitor and means for connecting the other end of said resistor to the first part of said potentiometer, further means for connecting the second and last parts of said potentiometer to the ground, further comprising a second control means for said second input of said oscillator wherein said second control means comprises an error amp, a 1.2 volt reference and a third rectifier, means for connecting the first part of said error amp to said first part of said potentiometer and means for connecting the second part of said error amp to the first part of said 1.2 volt reference and means for connecting the last part of said 1.2 volt reference to ground and further means for connecting the last part of said error amp to said second input of said oscillator, means for connecting said rectifier anode end to the ground and cathode end to said second input of said oscillator, said second control means wherein the voltage at the noninverting input is more negative than the 1.2 volt reference, the oscillator is gated ON, when the voltage at the noninverting input is more positive than the 1.2 volt reference, the oscillator is gated OFF thus regulating the charge level of the output capacitor;

a third control means for said third input of said oscillator wherein said third control means comprises a frequency timing capacitor, means for connecting said capacitor in series between said third input of said oscillator and ground, means wherein said timing capacitor is used to

determine the frequency of said oscillator and further means for controlling said oscillator's frequency whether increased or decreased by said first control means or said second control means of said oscillator;

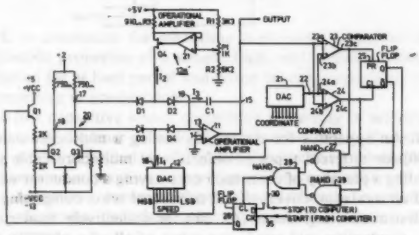
a system of transferring energy from said output capacitor to charge a battery comprising a fourth rectifier and a lamp, means for connecting said rectifier and said lamp in series between said output capacitor and said battery to be charged, means for transferring said energy from said output capacitor to said battery to be charged.

4,510,432

GENERATION OF VECTORS

Francois G. Desjardins, Maryhill, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Feb. 7, 1983, Ser. No. 464,490
Int. Cl.[3] G06F 3/13; H03K 13/02
U.S. Cl. 320—1 **16 Claims**



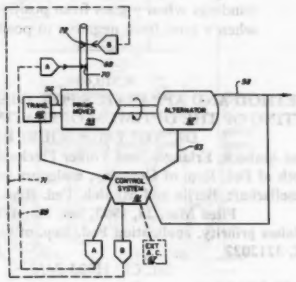
1. A vector generator comprising first means for providing a signal indicative of the rate at which said vector is to be drawn, said first means comprising an operational amplifier having an output terminal and first and second input terminals, means connecting said first input terminal to a source of reference potential, a capacitor connected between said output terminal and said second input terminal, a constant current DAC having multiple input terminals and an output terminal at which a constant but variable output current is derived and a second constant current generator providing a constant current of opposite polarity to that of said DAC and one-half the magnitude of the maximum output current of said DAC, said DAC and said second constant current generator being connected to said second terminal and said capacitor in such a way that, depending on the magnitude of said output current of said DAC, said capacitor can be charged either positively or negatively; switching means having a first state and a second state, said switching means interconnecting said capacitor with both said DAC and said second constant current generator and enabling said capacitor to be charged in said first state of said switching means but preventing said capacitor from being charged in said second state of said switching means; second means for providing a signal indicative of the length of said vector to be drawn, said second means comprising a constant voltage DAC having multiple input terminals and an output terminal at which a constant but variable output voltage indicative of said length is derived; third means for comparing said output voltage of said constant voltage DAC and the voltage across said capacitor and generating a control signal when said voltages are equal; fourth means for utilizing said control signal to charge said state of said switching means from said first state thereof to said second state thereof to prevent further charging of said capacitor; fifth means for supplying to said input terminals of said constant current DAC a first signal that determines the rate at which said vector is to be drawn, to said input terminals of said constant voltage DAC a second signal that determines the length of said vector to be drawn and to said switching means a third signal that changes said state of said switching means from said second state to said first state thereof to enable said capacitor to be charged.

4,510,433

VARIABLE-SPEED CONSTANT-FREQUENCY ALTERNATOR

Maurice G. Gamze, 1077 Ridgewood Dr., and Louis H. Sprung, 570 Rambler La., both of Highland Park, Ill. 60035

Filed Mar. 23, 1983, Ser. No. 478,505
Int. Cl.[3] H02P 9/42, 9/48
U.S. Cl. 322—32 **29 Claims**



1. A variable-speed, predetermined frequency of x Hz., where $x>0$, alternating-current generating device comprising:

(A) an alternator having:

(1) a wound rotor with n magnetic pole pairs; and

(2) a stator having n magnetic pole pairs, where n is a positive integer;

(B) prime mover means, coupled to said rotor, for moving said rotor at a rotational velocity of z rps., where z is a variable real number, relative to said stator;

(C) transducer means, coupled to said rotor, for producing h pulses per revolution of said rotor, where h is a positive integer;

(D) driving means, coupled to said transducer means and to said rotor pole pairs, for electromagnetically rotating said rotor pole pairs about said rotor at a rotational velocity of $y=(x-z)/n$ rps. relative to said rotor, said driving means including:

(1) for each of said n rotor pole pairs three windings spaced substantially equidistant about said center of rotation;

(2) for each particular winding of the three particular windings of a particular pole pair, current means, coupled to said particular windings for creating an ac., sinusoidal current in each of said particular windings with a frequency of v Hz., said current in any one particular winding being 120° in phase ahead of the ac. current in one of the remaining two particular windings and 120° in phase behind the current in the other of the remaining two particular windings, said current means including for each one of said particular windings:

(a) a current controller, coupled to the leads of said one particular winding, having k configurations, where k is a positive integer, and producing a predetermined magnitude of substantially steady amplitude current through said one particular winding for each of said configurations, the ratio of said magnitude of said current with said current controller in the i^{th} configuration to said magnitude of said current with said current controller in the j^{th} configuration, where i and j are positive integers not greater than k, substantially equals the ratio of the values of said sinusoidal wave at the phase angle positions i/k and j/k through a cycle of said wave;

(b) current switching means coupled to said current controller, for switching, for each $1 \leqq i \leqq k$ said current controller from said i^{th} configuration to said $(i+1)^{th}$ configuration where the $(k+1)^{th}$ configuration is the first configuration;

(c) current timing means, coupled to said current switching means and to said transducer means, for inducing said switching means to switch from said i^{th} configuration to said $(i+1)^{th}$ configuration at an instantaneous rate equal to the absolute value of (ky) switches per second; and

(d) current reversing means, coupled to said controller and said transducer for inverting the direction of the change of phase of the current in said particular three windings when y goes from positive to negative and when v goes from negative to positive.

4,510,434

METHOD AND APPARATUS FOR THE AUTOMATIC SETTING OF THE OPTIMUM OPERATING POINT OF A D-C VOLTAGE SOURCE

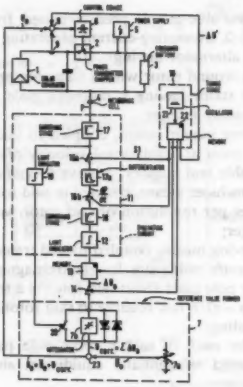
Franz Assbeck, Erlangen, and Volker Fleckenstein, Nuremberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Mar. 24, 1983, Ser. No. 478,343

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1982, 3212022

Int. Cl.³ H02J 3/12

U.S. Cl. 323—237 **10 Claims**



7. Apparatus for automatically setting the optimum operating point of a d-c voltage source having internal resistance, especially of a solar generator, comprising

(a) a controllable energy transmitter connected to the d-c voltage source;

(b) a control device for the energy transmitter, having an input for accepting a command variable as a reference value for an electrical state variable of the d-c voltage source;

(c) a reference value former for forming a reference value, having its output coupled to said command variable input;

(d) a timing stage for generating a supplemental value output signal;

(e) means to temporarily add said supplemental reference value to said reference value;

(f) means for sensing the output power of said energy transmitter;

(g) an evaluating circuit for determining the derivative with respect to time of the power output, having the output of said means for sensing as an input as it changes due to the addition of said supplemental reference value; and

(h) means, providing an input to said reference value former, for readjusting the reference value furnished by said reference value former as a function of the sign of the differential power change determined by said evaluating circuit.

4,510,435

APPARATUS FOR ELECTRICALLY TESTING MULTI-CORE CABLES

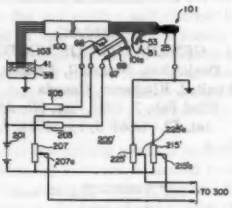
Shogo Tanno, Itami, Japan, assignor to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

Filed Aug. 19, 1982, Ser. No. 409,551

Claims priority, application Japan, Sep. 2, 1981, 56-139009

Int. Cl.³ G01R 31/02, 31/12

U.S. Cl. 324—52 **12 Claims**



1. An apparatus for electrically testing a multi-core cable (**100**) for different types of defects, said multi-core cable including a plurality of cores each core having a conductor wire and an insulation covering said conductor wire, comprising:

first connecting means (**25, 25'**) for collectively rendering conductive said conductor wires of all of a plurality of cores of said multi-core cable at one end thereof,

second connecting means (**41**) providing a current flow path for collectively rendering conductive said conductor wires of all of said plurality of cores of said multi-core cable at the other end thereof,

resistance means operatively coupled to said second connecting means for providing a predetermined resistance value in said current flow path for causing a change in the magnitude of a current flowing through said current flow path in response to different defects in the respective core,

core pick-up and transferring means (**6**) mounted at said one end of said multi-core cable for picking up cores separately on a one by one basis and for transferring a picked up core,

separating means (**57**) for electrically separating the core picked up and transferred by said core pick-up and transferring means, from said first connecting means,

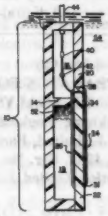
pick-up detecting means (**67, 68, 207, 301**) for detecting whether a core is picked up and transferred by said pick-up and transferring means,

power supply means (**69, 201**) for supplying electricity to the conductor wire of said electrically separated picked up core so that a current of different magnitude may flow through the conductor wire of said picked up core, through said predetermined value resistance means operatively coupled to said second connecting means, through conductor wires of other cores, and through said first connecting means for enabling detection of different defects in accordance with said different current magnitude, and evaluating means (**200, 300**) including first and second threshold defining means for defining first smaller and second larger predetermined threshold values, conductor means operatively connecting said evaluating means to said power supply means through said resistance means for determining said different defects in the form of an insulation breakdown state or in the form of a discontinuity state, or for indicating a normal state of said picked up core as a function of a relative magnitude of said current with respect to said first and second threshold values.

4,510,436
DIELECTRIC MEASURING SYSTEMS

Leonard S. Raymond, Tucson, Ariz., assignor to Southwest Medical Products, Incorporated, Tucson, Ariz.

Filed Jul. 15, 1982, Ser. No. 399,126
Int. Cl.[3] G01R 27/26
U.S. Cl. 324—61 P 22 Claims



1. A transducer for measuring a property related to the dielectric properties of a sample fluid, said transducer being adapted for at least partial immersion in said sample fluid and comprising in combination:

a first capacitive sensor comprising a plurality of interdigitated coplanar electrically conductive metal film electrodes deposited on an electrically insulating substrate;

a second capacitive sensor comprising a plurality of intedigitated coplanar electrically conductive metal film electrodes deposited on an electrically insulating substrate;

said first and second sensors being mounted so as to be (a) mechanically and electrostatically isolated from one another and (b) in direct thermal communication with one another; and

an enclosure surrounding said second capacitive sensor for containing a reference fluid so that said reference fluid is (a) in contact with said second capacitive sensor, (b) in fluid and electrical isolation from said first capacitive sensor and a fluid sample contacted by said first capacitive sensor and (c) in thermal communication with a fluid sample contacting said first capacitive sensor.

4,510,437
APPARATUS AND METHOD FOR MEASURING THE PERMITTIVITY OF A SUBSTANCE

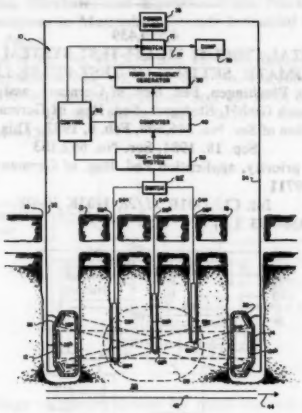
Magdy F. Iskander, Salt Lake City, Utah, assignor to University of Utah, Salt Lake City, Utah

Division of Ser. No. 194,153, Oct. 6, 1980, Pat. No. 4,396,062. This application Jul. 29, 1983, Ser. No. 518,532
Int. Cl.[3] G01R 27/26
U.S. Cl. 324—61 R 29 Claims

1. An apparatus for measuring in situ the complex permittivity of a substance, the apparatus comprising:

a hollow ground plane conductor; and

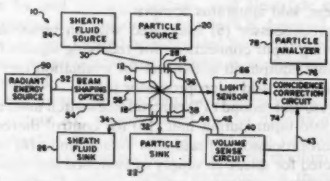
a center conductor, said center conductor being mounted within the hollow ground plane conductor and said center conductor being adjustable relative to the hollow ground plane conductor such that the capacitance of the apparatus can be varied, thereby measuring the complex permittivity of varying volumes of the substance.



4,510,438
COINCIDENCE CORRECTION IN PARTICLE ANALYSIS SYSTEM

Robert Auer, Miami, Fla., assignor to Coulter Electronics, Inc., Ill.

Filed Feb. 16, 1982, Ser. No. 348,822
Int. Cl.[3] G01N 27/00
U.S. Cl. 324—71.4 29 Claims



1. Apparatus for correcting coincidence error occurring in parametric data obtained from a particle analysis system producing parametric data from particles, the correction being effected substantially at the time that the coincidence error occurs in a parametric datum of said data, the parametric datum representing at least one particle analysis parameter and the error being introduced into the datum at the time of measurement and resulting from coincidence of at least two particles in the length of a measurement aperture as said particles pass through the aperture, the apparatus comprising:

A. measurement means producing said parametric datum in response to a measurement made through the lenth of said aperture as at least one particle passes through the length of the aperture, said measurement means being incapable of distinguishing between coincidence and non-coincidence of particles in the aperture;

B. detection means producing a detection signal in response to sensing the presence of an individual particle in said aperture, the detection means sensing the presence of individual particles other than through the length of said aperture; and

C. correction means for modulating said parametric datum in response to said detection signal after the production of

said parametric datum and said detection signal to obtain corrected parametric data free of said coincidence error.

4,510,439

DIGITAL CIRCUIT MULTI-TEST SYSTEM WITH AUTOMATIC SETTING OF TEST PULSE LEVELS

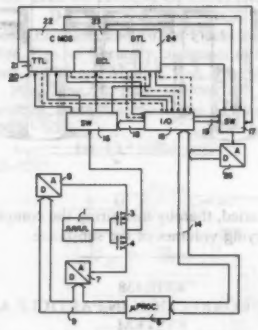
Rolf Roth, Plochingen, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 346,508, Feb. 8, 1982,. This application Sep. 18, 1984, Ser. No. 652,153

Claims priority, application Fed. Rep. of Germany, Mar. 13, 1981, 3109711

Int. Cl.³ G01R *31/28*; H03K *19/08*

U.S. Cl. 324—73 AT **2 Claims**



1. Apparatus for testing electronic equipment by a sequence of tests respectively requiring the presence of d.c. supply voltages subject to variation from test to test in d.c. supply voltage value requirement, and having a test signal pulse generator automatically adaptable to said d.c. supply voltage value requirement, said apparatus comprising:

a microprocessor (6) associated with an input/output unit having input connections for receiving signals from electronic equipment under test for evaluation thereof under control of said microprocessor (6);

first (16) and second (17) controllable switch units connected to said input/output unit (15) for control thereof by said microprocessor (6) said first switch unit (16) being connected for selective supply of switched test signals to said electronic equipment and said second switch unit (17) being connected for selective pick-up of d.c. supply voltage levels from portions of said equipment to be tested;

an analog-to digital converter (26) connected to said second switch unit (17) and to said microprocessor (6) for furnishing to said microprocessor (6), in digital form, d.c. supply voltage levels selectively picked up by said second switch unit (17);

a pulse generator (1) and a limit-level-controllable output stage therefor for supplying test pulses to said first switch unit (16) for selective application of said test pulses to said electronic equipment under test, said limit-level-controllable output stage comprising a push-pull transistor-pair (3,4) stage having their respective control electrodes connected to said pulse generator and having their switched-path electrodes connected for alternate switching on of said transistors by operation of said generator;

a first digital-to-analog converter connected to said microprocessor and connected for applying a first d.c. voltage of a magnitude controlled by said microprocessor to a first switching path electrode of a first transistor of said transistor-pair stage, and

a second digital-to-analog converter connected to said microprocessor and connected for applying a second d.c. voltage of a magnitude controlled by said microprocessor to a first switching path electrode of the second transistor of said transistor-pair stage,

said transistors each having a second switching path electrode, said second switching path electrodes of the respective transistors being connected to each other and also to said first switching unit (16) for supplying test pulses thereto in the form of pulse-like alternating transitions between voltages controlled by said microprocessor (6) through said first and second digital-to-analog converters.

4,510,440

METHODS AND APPARATUS FOR FREQUENCY RESPONSE ANALYSIS

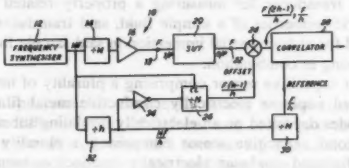
Alan Ryder, Church Crookham, England, assignor to Schlumberger Electronics (U.K.) Limited, Farnborough, England

Filed Dec. 1, 1982, Ser. No. 445,791

Claims priority, application United Kingdom, Dec. 3, 1981, 8136536

Int. Cl.³ G01R *23/16*

U.S. Cl. 324—77 G **6 Claims**



1. A method for testing the response of a system to an input signal at a frequency F using a correlator capable of operating at a lower frequency F/h, where h is a number greater than 1, comprising the steps of:

generating a first signal at said frequency F;

generating a second signal at a frequency F/h;

generating a third signal at a frequency F(h−1)/h;

applying said first signal to the system under test;

multiplying the output signal from the system by the third signal to produce a product signal;

and comparing the product signal in the correlator with the second signal to analyze system response to said input signal.

4,510,441

ELECTRIC FIELD DETECTOR

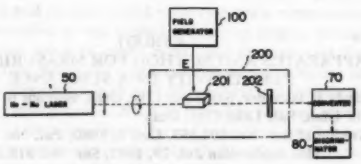
Tomio Yasuda, Kasukabe, and Toshiyuki Ichiyama, Higashimine, both of Japan, assignors to Kabushiki Kaishi Meidensha, Japan

Filed Jun. 14, 1982, Ser. No. 388,477

Claims priority, application Japan, Jun. 12, 1981, 56-90537; Jun. 15, 1981, 56-91914

Int. Cl.³ G01R *31/00*

U.S. Cl. 324—96 **11 Claims**



1. An electric field detector comprising:

(a) an electric field generating means for generating an electric field,

(b) a light source for generating light,

(c) an electric field detecting means for detecting change of

electric field strength in said electric field generating means,

(d) a photoelectric converting means for converting an output light signal from said electric field detecting means to an electric signal,

(e) a discriminating means for discriminating changes in the electric field strength of the electric field generating means, and

(f) said electric field detecting means being provided in the vicinity of said electric field generating means, said electric field detecting means optically connected to both said light source and said photoelectric converting means, and said discriminating means being electrically connected to said photoelectric converting means,

(g) said electric field detecting means comprising an electric field-sensitive means for transmitting linearly polarized light from said light source in a Z-direction and/or approximately in a Z-direction of a quartz crystal and for changing the phase difference between two specific oscillations in said quartz crystal, and

(h) said electric field-sensitive means comprising a Pockels cell made from Z-cut quartz and/or approximately-z-cut quartz.

4,510,442
MEASURING SYSTEM FOR EXCEEDINGLY WEAK CURRENTS

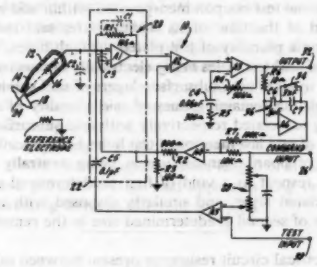
Erwin Neher, Gottingen, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V., Gottingen, Fed. Rep. of Germany

Filed Jun. 24, 1982, Ser. No. 391,604

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3144003

Int. Cl.³ G01R *17/06*

U.S. Cl. 324—99 R **5 Claims**



1. In a precision measurement system for measuring electrical currents of the order of a few pico-amperes, adapted to measurement of the currents in individual ionic channels in biological membranes, of the kind comprising:

a pipette, incorporating an internal electrode;

a current-to-voltage converter, including a very high resistance precision resistor, having an input connected to the pipette electrode, for generating a voltage representative of a current flowing in the electrode;

a source of reference potential, connected to the converter; and an output amplifier responsive to the voltage on the precision resistor;

the improvement comprising:

feedback amplifier means, having an input connected to the output amplifier and having an output connected to the source of reference potential, for controlling the reference potential source, and thus the pipette potential, so that the average current from the pipette electrode, over a characteristic time interval, is maintained at approximately zero.

4,510,443
VOLTAGE MEASURING DEVICE

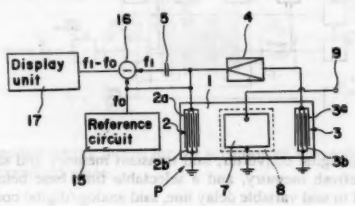
Ritsuo Inaba, Hirakata, and Kiyotaka Wasa, Nara, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Continuation of Ser. No. 187,079, Sep. 15, 1980, abandoned. This application May 11, 1983, Ser. No. 492,160

Claims priority, application Japan, Sep. 19, 1979, 54-121176

Int. Cl.³ G01R *19/26, 29/12*

U.S. Cl. 324—120 **3 Claims**



1. A voltage measuring device for receiving and measuring a voltage to be measured and for providing an output signal corresponding thereto, said device comprising:

a first medium of the double layer type for propagating surface acoustic waves, said first medium comprising a piezoelectric thin film which is laminated on a substrate comprising a non-piezoelectric material;

a first transducer means coupled to said first medium for launching surface acoustic waves through said first medium when an input a.c. signal is applied thereto;

a second transducer means coupled to said first medium for receiving surface acoustic waves propagated thereto from the first transducer means and for converting the received acoustic waves into a first output a.c. signal;

electrode members for receiving said voltage to be measured and for effecting an electric field change in the first medium by said received voltage, said electrode members comprising a continuous body which is disposed so as to cover an area located between said first and second transducers, wherein said first medium is interposed therebetween; and

a detecting means for detecting the frequency change in said first output a.c. signal caused by the distortion of said piezoelectric thin film which is in turn caused by the change in said electric field in said first medium and for providing an output signal corresponding thereto, said frequency change being representative of said voltage to be measured;

wherein said output signal from said detecting means comprises said output signal of said device.

4,510,444
DIGITAL MEASURING DEVICE WITH LIQUID-CRYSTAL PICTURE SCREEN

Werner Haussel, Feucht; Günter Roppelt, and Robert Kindermann, both of Nuremberg, all of Fed. Rep. of Germany, assignors to Metrawatt GmbH, Nuremberg, Fed. Rep. of Germany

Filed Jun. 4, 1982, Ser. No. 385,003

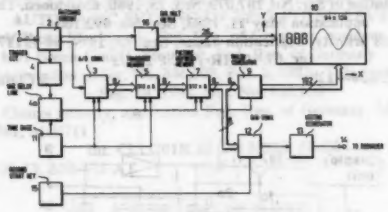
Claims priority, application Fed. Rep. of Germany, Jun. 6, 1981, 3122558

Int. Cl.³ G01R *13/20*

U.S. Cl. 324—121 R **5 Claims**

1. Digital measuring device, comprising a trigger generator having an input for receiving an analog measuring input signal, a variable delay line being connected to said trigger generator and having an output, an analog/digital converter receiving the analog measuring input signal, a transient memory connected to said analog/digital converter, a picture refresh memory connected to said transient memory for storing the measur-

ing input signal, a Walsh function generator connected to said picture refresh memory, a liquid-crystal picture screen being connected to and addressed by said Walsh function generator, the output of said variable delay line being connected to said



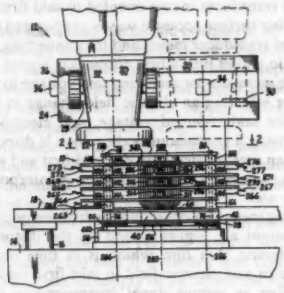
analog/digital converter, said transient memory and said picture refresh memory, and a selectable time base being connected to said variable delay line, said analog/digital converter and said transient memory.

4,510,445

MINIATURE CIRCUIT PROCESSING DEVICES AND MATRIX TEST HEADS FOR USE THEREIN

Joseph Kvaternik, 19366 McCourtney, Grass Valley, Calif. 95945

Filed Nov. 2, 1981, Ser. No. 317,413
Int. Cl.³ G01R *31/02, 1/06*
U.S. Cl. 324—158 F **11 Claims**



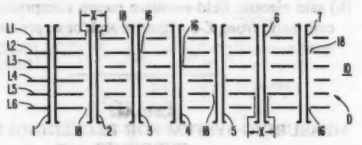
1. A miniature circuit processing device, comprising:
means forming a base plate;
a chuck disposed beneath said base plate and adapted to hold a silicon wafer or other means having an ordered array of contiguously disposed and regularly spaced indentical miniature circuits to be tested;
servomechanism means for positioning said chuck with respect to said base plate;
manual control means for controlling the operation of said servomechanism means;
first and second alignment means carried by said base plate and defining first and second optical axes which are precisely separated by a distance that is an integer multiple of the center-to-center spacing of said miniature circuits;
a test head carried by said base plate and disposed above said chuck and including a plurality of elongated conductive test probe means each of which has a first tip portion and a second tip portion, the latter being disposed in a predetermined array arranged about a test head axis located midway between said first and second optical axes and each being adapted to make electrical contact with a predetermined area of a miniature circuit to be tested, and a plurality of elongated test probe guide means including tube means adapted to slideably receive and frictionally engage an associated one of said test probe means and to provide electrical connection therewith; and
optical means for viewing said miniature circuits along said optical axes, whereby the alignment of one of said optical axes with a particular point on a first miniature circuit and the alignment of the other optical axis with a corresponding point on a second miniature circuit causes said test head axis and said probe means to be aligned in a predetermined manner with a third miniature circuit to be tested.

4,510,446

TEST COUPONS FOR DETERMINING THE REGISTRATION OF SUBSURFACE LAYERS IN A MULTILAYER PRINTED CIRCUIT BOARD

Robert E. Braun, Norristown, and John E. Benasutti, North Wales, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 3, 1982, Ser. No. 438,768
Int. Cl.³ G01R *31/22*
U.S. Cl. 324—158 R **5 Claims**



1. A test arrangement for a multilayer printed circuit board for determining the registration of the electrically conductive subsurface layers thereof relative to a multiplicity of active plated-through holes wherein predetermined ones of said active holes are electrically connected to a desired layer and insulated from electrical contact with the other layers by voids in the latter, said test arrangement comprising:
at least one test coupon incorporated within said multilayer board at the time of its manufacture, said test coupon having a plurality of test plated-through holes,
a first of said test holes being electrically connected in common to all of said subsurface layers of said printed circuit board, the remaining ones of said plurality of test holes being associated respectively with said subsurface layers, each of said last mentioned test holes being specified at the time of board manufacture as being centrally disposed with respect to a void of first predetermined size in its associated layer, and similarly disposed with respect to voids of second predetermined size in the remaining layers,
the electrical circuit resistance present between said first of said test holes and a given one of the remaining test holes providing an indication of the registration of the layer associated with said given test hole.

4,510,447

INSPECTION APPARATUS FOR ELECTROMAGNETICALLY DETECTING FLAWS IN THE WALL OF A PIPE

Mark C. Moyer, Missouri City, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Filed Oct. 26, 1981, Ser. No. 315,329
Int. Cl.³ G01N *27/72*; G01R *33/12*
U.S. Cl. 324—225 **10 Claims**

8. Apparatus for detecting flaws in the wall of a ferromagnetic pipe, comprising:
an electromagnet comprising a coil, a ferromagnetic center portion extending axially through the coil, two ferromagnetic end portions extending on both sides of the coil from said center portion generally radially with respect to the axis of the coil, a ferromagnetic wheel connected to each of said end portions on the end away from the center

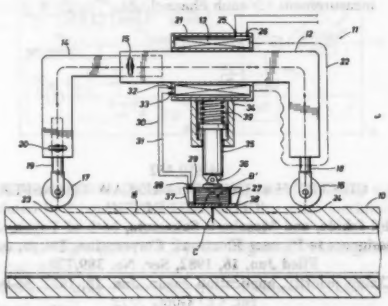
portion to function as poles for the electromagnet when said wheels are in contact with the surface of the wall of the ferromagnetic pipe;

means for electrically connecting the coil of said electromagnet to an input source of alternating current to generate a fluctuating magnetic field;

first detecting means for sensing a magnetic field and generating a signal corresponding thereto;

compensating detecting means positioned on the side of said first detecting means for sensing a magnetic field and generating a signal corresponding thereto;

mounting means extending from said center portion of said electromagnet and supporting said first detecting means and said compensating detecting means, and adapted to



yieldingly urge said first detecting means and compensating detection means against the pipe surface so that said first detecting means is between said poles and said compensating detecting means is positioned on the side of said first detecting means and between said poles when the poles are placed against the pipe surface;

means for subtracting the signal generated by the compensating means from the signal generated by the first detecting means thereby generating an output signal;

means for electrically connecting the output signal to a readable output device; and

means for adjusting the spacing between the two end portions of said electromagnet and the length of at least one of said end portions so that said apparatus may be adapted for detecting flaws in different size pipe.

4,510,448

DEVICE FOR GENERATING IMAGES OF AN EXAMINATION SUBJECT

Hermann Riedl, Erlangen, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

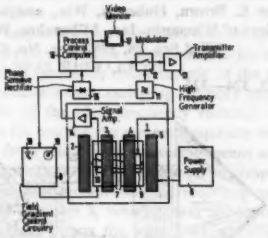
Filed Sep. 22, 1982, Ser. No. 421,290

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1981, 3139137

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **3 Claims**

1. Device for generating images of an examination subject with nuclear magnetic resonance in which means are present for applying magnetic fields to the examination subject and for detecting the excursion of the nuclear spins of the examination subject out of a state of equilibrium due to a high frequency magnetic excitation pulse and in which the means for applying magnetic fields comprises gradient coils, a control device for supplying the gradient coils and thereby establishing the position of the examined layer in the examination subject with reference to a three-dimensional coordinate system with a x-, y- and z-axis, characterized in that the control device comprises first setting means for the selection of the axis of the coordinate system which lies in the examined plane, and com-



prises second setting means for the selection of the inclination of the examined plane.

4,510,449

METHOD FOR RECORDING TWO-DIMENSIONAL NUCLEAR MAGNETIC RESONANCE SPECTRA AND A DEVICE FOR CARRYING OUT THE SAME

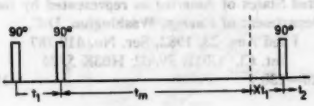
Richard R. Ernst, Winterthur; Kurt Wüthrich, Wallisellen, both of Switzerland, and Slobodan Macura, Belgrade, Yugoslavia, assignors to Spectrospin AG, Switzerland

Filed Nov. 1, 1982, Ser. No. 438,181

Claims priority, application Fed. Rep. of Germany, Nov. 4, 1981, 3143625

Int. Cl.³ G01R *33/08*

U.S. Cl. 324—309 **3 Claims**

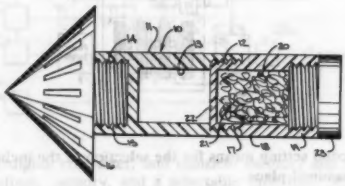


1. A method for recording two-dimensional nuclear magnetic resonance spectra of a nuclear spin system having spins between which a coupling exists, said coupling causing a shift of the resonance frequency of said spins, in which method said nuclear spin system is excited by three successive 90° pulses and an interferogram obtained after application of the third 90° pulse is subjected to Fourier analysis, in which further a plurality of such measurements is taken with different intervals between the first and the second 90° pulses known as the evolution period t_1 and the resulting different amplitudes of the resonance lines obtained by the said Fourier analysis are stored as instantaneous values of an additional interferogram and subjected to a second Fourier analysis, and in which simultaneously with each repetition of the measurement with a varied evolution period t_1 the time interval between the second and the third 90° pulses, which is known as the mixing time t_m, is systematically varied by increments covering the domain defined by the period of the frequency shifts caused by said couplings, characterized in that starting from an initial value t_{m0}, the mixing time t_m is varied proportionally to the evolution period t_1 whereby $t_m = t_{m0} + \chi t_1$ so that with an envisaged number of n measurements the time variation of the mixing time $t_{mn} - t_{m0}$, which is relatively small compared to t_{m0}, is substantially equal to the period of frequency displacements caused by said coupling, and in that the two-dimensional spectrum thus obtained is subjected to the techniques of triangular multiplication or symmetrization whereby all peaks which do not possess counterparts at the mirror symmetry position with respect to a main diagonal are eliminated.

4,510,450
APPARATUS AND ASSAY METHOD FOR THE QUANTITATIVE DETERMINATION OF MINERAL CONTENT IN BONE

Charles E. Brown, Hubertus, Wis., assignor to The Medical College of Wisconsin, Inc., Milwaukee, Wis.

Filed Sep. 28, 1982, Ser. No. 426,147
Int. Cl.³ G01R 33/08
U.S. Cl. 324—321 4 Claims

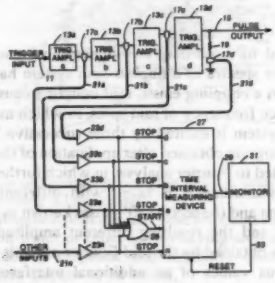


1. A rotor for an NMR spectrometer, said rotor having a cone shaped nose portion in a main body portion, said main body portion having a sample compartment for receiving a sample to be analyzed, such as unfractioned bone, a removable cover for the sample container and a reference material compartment, said sample and reference material compartment being positioned end to end along a longitudinal axis and being separated by a wall.

4,510,451
PREFIRE IDENTIFICATION FOR PULSE POWER SYSTEMS

Jerry L. Longmire, Los Alamos; Michael E. Thuot, Espanola, and David S. Warren, Los Alamos, all of N. Mex., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 23, 1982, Ser. No. 410,787
Int. Cl.³ G01R 29/02; H03K 5/26
U.S. Cl. 328—130.1 10 Claims



1. A prefire detection system for a high-power, high-frequency, multi-stage pulse generator, said prefire detection system comprising:

a plurality of pulse timing transmitters, each pulse timing transmitter thereof associated with and tailored to an individual stage of the multi-stage pulse generator, each pulse transmitter for sending an optical signal upon detection of a pulse;

a plurality of fiber optic cables, each fiber optic cable thereof associated with an individual pulse timing transmitter in said plurality thereof for receiving and transmitting therefrom said optical signal sent upon detection of a pulse;

a plurality of pulse timing receivers, each pulse timing receiver thereof associated with an individual fiber optic cable in said plurality thereof, each pulse timing receiver for receiving an optical signal transmitted by its associated individual fiber optic cable and for converting each received optical signal into an electrical pulse;

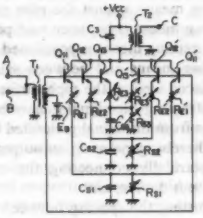
an OR gate inputted by all pulse timing receivers in said plurality thereof for combining all electrical pulses therefrom;

a time interval measuring device having a plurality of time interval measuring channels, each time interval measuring channel thereof associated with an individual pulse timing receiver in said plurality thereof for receiving therefrom an electrical pulse for stopping a time interval measurement therewith, said time interval measuring device also associated with said OR gate for starting all time interval measurements with the first electrical pulse combined therein, wherein said time interval measuring device provides an output signal representative of the time interval measurement for each channel.

4,510,452
CIRCUIT HAVING SQUARE-LAW TRANSFER CHARACTERISTIC

Kohji Ishida, and Masaharu Sakamoto, both of Tokyo, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 389,770
Claims priority, application Japan, Jun. 18, 1981, 56-94451
Int. Cl.³ G06G 7/12
U.S. Cl. 328—144 2 Claims



1. A circuitry having square-law characteristics comprising:

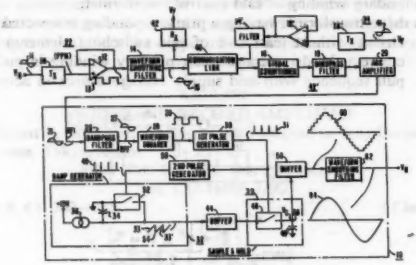
(a) a first and second group of active elements, each of said first and second group comprising a plurality of active elements, each active element having a control input and at least one controlled output and a controlled terminal other than said controlled output, said control inputs and said controlled outputs are respectively commonly connected with each other, and a plurality of characteristic adjusting means each of which includes an adjustable feedback resistor connected between said controlled terminal and a reference potential point and a capacitor for bypassing an AC potential developed across a portion of said adjustable feedback resistor, and distinct adjusting means provided for a pair including one of said plurality of active elements of said first group and a corresponding one of said plurality of active elements of said second group; and

(b) means for applying said control inputs of said active elements of said first and second groups with in-phase and anti-phase input signals respectively delivered from an input signal, wherein said controlled outputs of said active elements of first and second groups are commonly connected, and wherein said characteristic adjusting means are adjusted so that input/output transfer characteristic of the circuitry is an approximate square-law characteristic.

4,510,453
FREQUENCY MODULATION OR PULSE MODULATION DEMODULATOR

Shan C. Sun, Coral Springs, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 13, 1982, Ser. No. 397,944
Int. Cl.³ H03D *3/18*; H03K *9/06*; H04B *1/16*
U.S. Cl. 329—106 **8 Claims**



1. A demodulator for demodulating an alternating signal modulated by frequency modulation, or by pulse modulation, comprising:

means having a gain of K_m providing an alternating modulated signal,

means generating a first pulse train in response to said modulated signal,

means generating a second pulse train in response to said first pulse train,

means having a gain of K_d generating a ramp signal having a magnitude proportional to time,

sample-and-hold means for sampling and holding said ramp signal in response to pulses in said first pulse train,

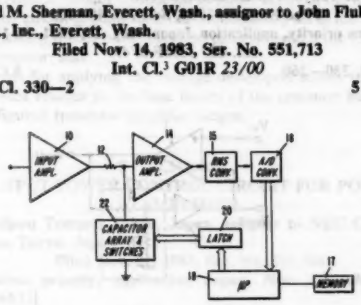
and means resetting said ramp signal generating means in response to said second pulse train, following each sampling of said ramp signal by said sample-and-hold means,

wherein the gains K_m and K_d are selected such that their product is unity, resulting in the voltage held by said sample-and-hold means being the demodulated signal.

4,510,454
APPARATUS FOR DIGITALLY CONTROLLED CALIBRATION OF FREQUENCY RESPONSE OF AMPLIFIERS

David M. Sherman, Everett, Wash., assignor to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Nov. 14, 1983, Ser. No. 551,713
Int. Cl.³ G01R *23/00*
U.S. Cl. 330—2 **5 Claims**



1. An apparatus for calibrating the frequency response of a system, comprising:

means for receiving an input signal;

amplifier means;

means for measuring an output signal developed by said amplifier means;

adjustable filter means composed of components that are selectively interconnectable to have a variable frequency response; and

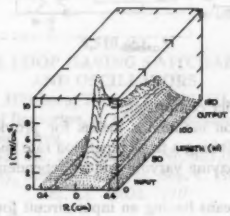
microprocessor means responsive to said measuring means for controlling said adjustable filter means to have a predetermined, ideal frequency characteristic of the system, said microprocessor means including memory means for storing a value of the ideal frequency response of said system, means for reading the present frequency response of the system from said output measuring means and control output means for modifying the frequency response of said filter means to approach the ideal frequency response.

5. The apparatus of claim 1, wherein said microprocessor means further includes means for selectively amplifying or attenuating signals at an output of said filter means.

4,510,455
TWO-DIMENSIONAL OPTIMIZATION OF FREE ELECTRON LASER DESIGNS

Donald Prosnitz, Walnut Creek, and Roger A. Haas, Pleasanton, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed May 4, 1982, Ser. No. 374,655
Int. Cl.³ H01S *3/10*
U.S. Cl. 330—4.3 **6 Claims**



1. A method for amplification of the optical radiation of predetermined wavelength $\lambda_s = 2\pi/k_s = 2\pi c/\omega_s$ and local electric field strength $E_s = \sqrt{2}\ mc^2\ e_s/e$, where e is the unit of electron charge and γmc^2 is relativistic energy of an electron propagating along a predetermined z-axis, the method comprising the steps of:

providing a transverse wiggler magnetic field of alternating polarity along the predetermined z-axis, the magnetic field having local field strength $B_w = \sqrt{2}\ mc\ b_w/e$ and local period $\lambda_w = 2\pi/k_w$;

directing a collimated beam of electrons having relativistic energy γmc^2 initially exceeding 2 MeV along the predetermined axis, in timed relationship with propagation of the optical radiation;

providing a substantially constant stable phase angle $\psi = \int (k_s + k_w)\ dz - \omega_s t + \phi_s$ associated with the electron beam so that ψ substantially satisfies the relation

$$\frac{d\psi}{dz} = k_w - \frac{k_s}{2\gamma^2}\left[1 + \frac{b_w^2}{k_w^2} - 2\frac{b_w e_s}{k_w k_s}\cos\psi + \frac{e_s^2}{k_s^2}\right] + \frac{d\phi_s}{dz} = 0$$

at a radius substantially

$$r \approx r_d \approx \left[\frac{2\Delta\gamma}{\gamma}\left(\frac{1}{b_w^2}+\frac{1}{k_w^2}\right)\right]^{\frac{1}{4}},$$

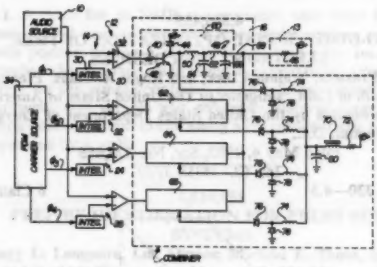
measured transversely from the predetermined electron beam axis, where $(2\Delta\gamma)\ m_e c^2$ is the representative initial energy spread in the electron beam.

4,510,456

PDM AMPLIFIER HAVING DISTORTION REDUCTION CIRCUIT

Hilmer I. Swanson, Quincy, Ill., assignor to Harris Corporation, Melbourne, Fla.

Filed Sep. 28, 1983, Ser. No. 536,783
Int. Cl.³ H03F 3/38
U.S. Cl. 330—10 **14 Claims**



1. An amplifier comprising:

pulse duration modulator means for providing a train of pulses exhibiting a fixed repetition rate and a fixed amplitude and having varying widths dependent upon an input signal;

switching means having an input circuit for receiving said pulses and being responsive thereto so that said switching means is on for a duration corresponding with the pulse width and having an output circuit connected in series with a load circuit which includes filter means for connection with a DC source so as to provide an amplified signal to said load circuit, said output circuit exhibiting stray capacitance thereacross so that said amplified signal is distorted at its leading edge relative to said pulse when the pulse on time of a said pulse is short relative to its off time causing the current flowing from said source through said load circuit to exhibit a low value delaying the charging of said stray capacitance; and

distortion reduction means in parallel with said load circuit including current insertion means for increasing the magnitude of the current flowing to said output circuit when the on time of a said received pulse is short to more rapidly charge said stray capacitance.

4,510,457

SWITCHING AMPLIFIER

Andreas Furrer, Turgi, and Johann Milavec, Windisch, both of Switzerland, assignors to BBC Brown, Boveri & Company, Limited, Baden, Switzerland

Filed Jan. 10, 1983, Ser. No. 456,977
Claims priority, application Switzerland, Jan. 11, 1982, 116/82
Int. Cl.³ H03F 3/387
U.S. Cl. 330—10 **6 Claims**

1. A switching amplifier comprising:

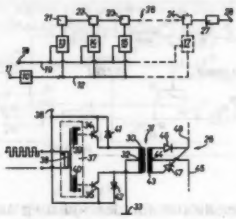
a signal converter adapted to convert an analog input signal into at least one pulse sequence;

at least two switching stages each comprising,

at least one control transformer having at least one primary winding coupled to said at least one pulse sequence, and plural secondary windings;

plural controllable switching elements each adapted to be coupled to a supply voltage source and each having a respective control electrode coupled to a respective secondary winding of said control transformer;

a drive transformer having a primary winding connected in circuit with at least two of said switching elements to connect the drive transformer primary winding in push-pull sequence with said supply voltage source in accordance with said at least one pulse sequence, and a secondary winding separated from said drive transformer primary winding such that no conductive connection exists therebetween; and



a rectifier assembly comprising a full wave rectifier coupled to the secondary winding of said drive transformer;

wherein each switching stage is parallel connected via the primary winding circuit of said drive transformer to said supply voltage source, and the rectifier assemblies of said switching stages are connected in series; and

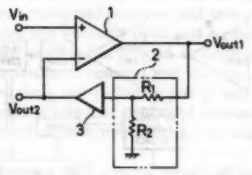
a low pass filter connected in series with said rectifier assemblies for filtering a signal generated by said series connected rectifier assemblies, wherein the filtered signal corresponds to the amplified output signal of said switching amplifier.

4,510,458

AMPLIFIER CIRCUIT

Tetsuo Sato; Yasuo Kominami, both of Takasaki; Yoshiyuki Takizawa, Tokorozawa, and Akira Haeno, Iruma, all of Japan, assignors to Hitachi, Ltd. and Pioneer Electronic Corp., both of Tokyo, Japan

Filed Aug. 18, 1982, Ser. No. 409,051
Claims priority, application Japan, Aug. 28, 1981, 56-134000
Int. Cl.³ H03F 3/45
U.S. Cl. 330—260 **5 Claims**



1. An amplifier circuit for producing first and second output signals of low distortion comprising an operational amplifier having a noninverting input terminal to which an input signal is to be applied, an inverting input terminal, and an output terminal from which a first output signal is derived; means for

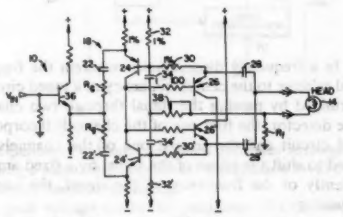
feeding back the first output signal from said output terminal of said operational amplifier to the inverting input terminal thereof, including a negative feedback circuit having its input connected to said output terminal of said operational amplifier and an impedance converter connected between the output of said negative feedback circuit and said inverting input terminal of said operational amplifier, wherein said negative feedback circuit comprises a first resistor connected between the input and output of the negative feedback circuit and a second resistor connected between the output of the negative feedback circuit and a ground potential; and means for deriving a second output signal from the output of said impedance converter.

4,510,459

WIDEBAND RECORD AMPLIFIER

Barrett E. Guisinger, Saratoga, Calif., assignor to Sony Corporation, Tokyo, Japan

Filed Nov. 10, 1982, Ser. No. 440,445
Int. Cl.³ H03F 3/30
U.S. Cl. 330—265 **5 Claims**



1. A wideband amplifier for driving a load which is primarily inductive in response to an input signal, said amplifier comprising;

a circuit ground;

a pair of common-base configured transistor amplifier stages operating in push-pull fashion, the transistors being of opposite polarity and each having a separate emitter input for receiving the input signal, a separate base input for receiving a feedback signal and a separate collector output the two collector outputs being directly connected together;

a pair of buffer amplifier stages, each having an input coupled to said connected together collector outputs of said common-base configured amplifier stages and an output connected in series with the load to the circuit ground;

a feedback resistor connected in series between the load and the circuit ground such that substantially all of the current passing through the load also passes through the feedback resistor; and

means for applying the voltage developed across the feedback resistor to the base inputs of the common base configured transistor amplifier stages.

4,510,460

OUTPUT POWER CONTROL CIRCUIT FOR POWER AMPLIFIER

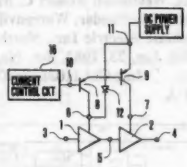
Yoshiharu Tamura, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 553,708
Claims priority, application Japan, Nov. 25, 1982, 57-177244[U]
Int. Cl.³ H03G 3/30
U.S. Cl. 330—285 **8 Claims**

1. An output power control circuit for a power amplifier comprised of an input amplifier for reception of an input signal having a power supply terminal and an output amplifier for delivery of a power output signal also having a power supply terminal, said input and output amplifiers being connected in series, said control circuit comprising:

a DC power supply;

at least first and second transistors, said first transistor being operative to supply power from said DC power supply to the power supply terminal of said output amplifier, said second transistor being operative to supply power from said DC power supply to the power supply terminal of said input amplifier and responsive to an external current



control signal for controlling the supply of power to said input amplifier;

means for passing the base current of said first transistor as part of the power supply current of said input amplifier to minimize the current value of the current control signal at a maximum output; and

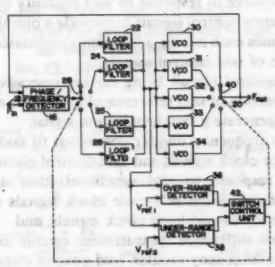
means connected between said DC power supply and said power supply terminal of input amplifier, for preventing degradation of power efficiency when the output is set to be lower than the maximum output.

4,510,461

PHASE LOCK LOOP HAVING SWITCHABLE FILTERS AND OSCILLATORS

Eric J. Dickes, Hillsboro; Thomas C. Hill, III, and Robert T. Flegal, both of Beaverton, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Jul. 22, 1982, Ser. No. 401,051
Claims priority, application Japan, Sep. 1, 1981, 56-137677
Int. Cl.³ H03L 7/10
U.S. Cl. 331—1 A **5 Claims**



1. A phase lock circuit, comprising:

means for detecting phase and frequency differences between an input signal and an output signal and generating a detection signal representative of said differences;

filter means responsive to said detection signal for producing a control voltage, said filter means having a plurality of selectable frequency ranges;

variable-frequency signal generation means responsive to said control voltage for producing said output signal, said variable-frequency signal generation means having a plurality of selectable frequency ranges matchable with those of said filter means; and

selection means responsive to said control voltage for select-

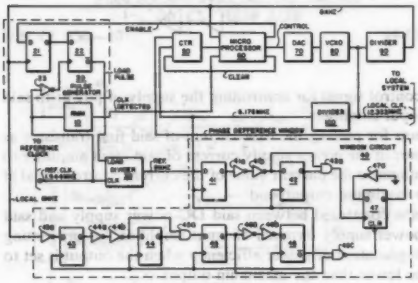
ing filter means and variable-frequency signal generation means having matched frequency ranges.

4,510,462

CIRCUIT TO MINIMIZE LOCAL CLOCK FREQUENCY DISTURBANCES WHEN PHASE LOCKING TO A REFERENCE CLOCK CIRCUIT

Ivan L. Edwards, Westmont; Robert C. McLaughlin, Bloomingdale, and Max S. Macrander, Warrenville, all of Ill., assignors to GTE Automatic Electric Inc., Northlake, Ill.

Filed Jun. 23, 1983, Ser. No. 507,436
Int. Cl.³ H03L *7/10*
U.S. Cl. 331—1 A **30 Claims**



1. A clock signal phase locking arrangement for use in a switching system which includes a source of reference clock signals, said phase locking arrangement comprising:

a control circuit operative to provide a plurality of local clock frequency control signals, said control circuit being connected to said reference clock signal source and further operative in response to an absence of said reference clock signals for a predetermined time to maintain the local clock frequency control signal in its current state;

a local clock circuit connected to said control circuit and operative in response to said plurality of local clock frequency control signals to provide a plurality of local clock signals each having a frequency associated with a different one of said control signals;

said control circuit being further operative in response to detection of said reference clock signals after said absence to generate a synchronization signal;

a first frequency divider connected to said source of reference clock signals and said control circuit, and operative in response to said synchronization signal to provide counted down reference clock signals of the same frequency as said local clock signals; and

a phase difference measurement circuit, connected to said first frequency divider, said control circuit and said local clock circuit, and operative in response to said counted down reference clock signals and said local clock signals to provide a phase difference signal representative of the phase difference between each of said counted down reference clock signals and an associated one of said local clock signals;

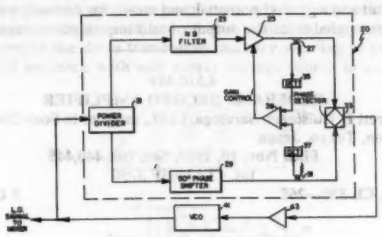
said control circuit being further operative in response to each of said phase difference signals to provide an associated one of said control signals of a characteristic representative of the duration of said phase difference signal, whereby the frequency of said local clock circuit is adjusted to eliminate the difference in phase between said local clock signals and said counted down reference clock signals.

4,510,463

AUTOMATIC GAIN CONTROLLED FREQUENCY DISCRIMINATOR FOR USE IN A PHASE LOCKED LOOP

Zvi Galani, Bedford, and Raymond C. Waterman, Jr., Westford, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Apr. 22, 1983, Ser. No. 487,778
Int. Cl.³ H03L *7/02*
U.S. Cl. 331—15 **2 Claims**



1. In a frequency discriminator wherein the frequeny of a signal relative to the center frequency of a tuned circuit is to be determined by passing the signal through two channels to a phase detector, the first one of the channels incorporating the tuned circuit and the second one of the channels being arranged to shift the phase of the signal by a fixed amount independently of the frequency of the signal, the improvement comprising:

(a) a variable gain amplifier disposed in the first one of the channels between the tuned circuit and the phase detector;

(b) means for sensing the amplitudes of the signal out of each one of the two channels; and

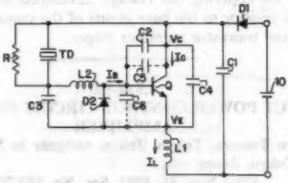
(c) means, responsive to the difference between the amplitudes of the signals out of the two channels, for producing a gain control signal applied to the variable gain amplifier to change the amplitude of the signal out of the amplifier to null the difference between the amplitudes of the signals out of the two channels.

4,510,464

LC-SWITCHED TRANSISTOR OSCILLATOR FOR VIBRATOR EXCITATION

Minoru Takahashi, Funabashi, Japan, assignor to TDK Corporation, Tokyo, Japan

Filed Sep. 29, 1982, Ser. No. 427,772
Claims priority, application Japan, May 29, 1982, 57-90509
Int. Cl.³ H03B *5/36*
U.S. Cl. 331—116 R **5 Claims**



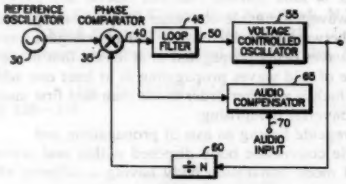
1. A vibrator exciting circuit comprising a self-oscillation circuit wherein a drive transistor operates in a switching mode, the ON-period of said transistor being determined by inductance and capacitance between the base and the emitter of said transistor and capacitance between the base and the collector of said transistor, the OFF-period of said transistor being deter-

mined by inductance and capacitance between the collector and the emitter of said transistor, the vibrator being connected between the collector and the emitter of said transistor, the frequency of the ON-period of said transistor being set in the neighborhood of the resonance frequency of said vibrator so that said vibrator exciting circuit oscillates with its oscillation frequency pulled in said resonance frequency of said vibrator.

4,510,465
LINEAR GAIN VOLTAGE CONTROLLED OSCILLATOR WITH MODULATION COMPENSATION

Craig W. Rice, Ft. Lauderdale, and Marc H. Popek, Tamarac, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 12, 1983, Ser. No. 522,623
Int. Cl.³ H03C *3/08, 3/09*
U.S. Cl. 332—16 T **9 Claims**



1. A compensated voltage controlled oscillator arrangement for providing a substantially constant modulation level over a wide frequency band, comprising:

a linear gain voltage controlled oscillator (VCO) having a control input and responsive to a control voltage for providing a substantially constant change in VCO gain factor K_0 for a fixed change in said control voltage over a predetermined range of frequencies;

input means for receiving an input modulating signal; and

linear compensation means, coupled to said input means and said control input of said voltage controlled oscillator and responsive to said control voltage for providing a compensated output signal to said contol input of said VCO having a substantially constant change in signal level for a fixed change in said control voltage over said predetermined range of frequencies, so that the product of said compensated output signal and said VCO gain factor K_0 is substantially constant over said predetermined range of frequencies.

4,510,466
SWITCHED CAPACITOR SSB MODULATOR

Chieh Chang, Belmont, and Man S. Lee, San Mateo, both of Calif., assignors to GTE Lenkurt Incorporated, Phoenix, Ariz.

Filed Jun. 28, 1982, Ser. No. 392,971
Int. Cl.³ H03C *1/02;* **H03K** *7/00*
U.S. Cl. 332—31 R **24 Claims**

1. An integrable switched capacitor single-sideband modulator comprising:

an operational amplifier having an input terminal and an output terminal;

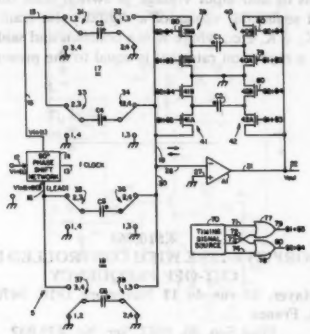
first and second capacitors C1 and C2;

first switch means operating at a prescribed rate in first and second non-overlapping switch states for alternately (1) discharging one of C1 and C2 while connecting the other of C1 and C2 as a feedback capacitor across said amplifier, and (2) connecting said one of C1 and C2 as a feedback capacitor across said amplifier while discharging said other of C1 and C2;

first means responsive to a baseband input signal for producing first and second quadrature-phase signal voltages on associated first and second lines;

second means for converting the first signal voltage into a first representative electrical charge flow signal on said input terminal that is a function of the product of said first signal voltage and a first digital pulse train of format +K, +K, −K, −K, etc., where K is a constant and said first pulse train has a repetition rate that is equal to the prescribed rate; and

third means for converting the second signal voltage into a second representative electrical charge flow signal on said input terminal that is a function of the product of said



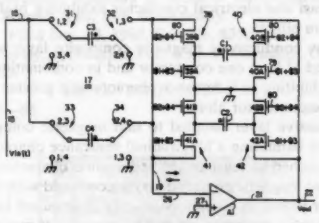
second signal voltage and a second digital pulse train that is of the same format and the same repetition rate as said first pulse train and is 90° out of phase with respect to said first pulse train;

said operational amplifier and switched-feedback capacitors C1 and C2 combining the first and second charge flow signals on said input terminal for producing a single-sideband signal on said output terminal.

4,510,467
SWITCHED CAPACITOR DSB MODULATOR/DEMODULATOR

Chieh Chang, Belmont, and Man S. Lee, San Mateo, both of Calif., assignors to GTE Communication Systems Corporation, Phoenix, Ariz.

Filed Jun. 28, 1982, Ser. No. 393,221
The portion of the term of this patent subsequent to Apr. 9, 2002, has been disclaimed.
Int. Cl.³ H03K *1/02, 7/00*
U.S. Cl. 332—31 R **17 Claims**



1. An integrable switched capacitor circuit for operating in an amplitude modulator and/or demodulator comprising:

an operational amplifier having an input terminal and an output terminal;

first and second capacitors C1 and C2;

first switch means operating at a prescribed rate in non-overlapping switch states for alternately discharging one of C1 and C2 while connecting the other of C1 and C2 as a feedback capacitor across said amplifier, and connecting

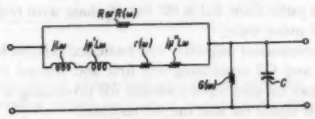
said one of C1 and C2 as a feedback capacitor across said amplifier while discharging said other of C1 and C2; and second means periodically operative in combination with said amplifier and feedback capacitors in a plurality of non-overlapping switch states at the prescribed rate for converting an input signal voltage into a representative electrical charge flow signal on said input terminal of said amplifier that is proportional to the product of representations of said input voltage in switch state time intervals and sequential values of a digital pulse train +K, +K, −K, −K, etc., where K is a constant and said pulse train has a repetition rate that is equal to the prescribed rate.

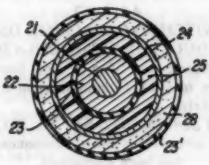
4,510,468

RF ABSORPTIVE LINE WITH CONTROLLED LOW PASS CUT-OFF FREQUENCY

Ferdy Mayer, 43 rue du 11 Novembre 1918, 94700 Maisons Alfort, France

Filed Sep. 30, 1982, Ser. No. 429,032
Int. Cl.³ H01P 1/215, 1/23
U.S. Cl. 333—12 **41 Claims**





1. A cable for the transmission of electrical energy and signals, comprising:

at least one electrical conductor exhibiting high frequency skin effect;

a low conductivity magnetic composite layer surrounding said at least one conductor and in combination therewith exhibiting an inductance characteristic greater than that of the conductor alone;

a resistive layer coupled to said magnetic composite layer and exhibiting a longitudinal resistance characteristic (R) matched at least to the inductance characteristic (L) of said magnetic composite layer combined with the conductor to obtain a correspondingly determined low pass frequency characteristic α (attenuation per meter of cable), wherein α/f (f=frequency) has a maximum value at a frequency f_{max}, where

$f_{max} \approx 0.28\ (R/L)$

such that within a predetermined transition frequency range, current flow switches from said at least one conductor to said resistive layer; and

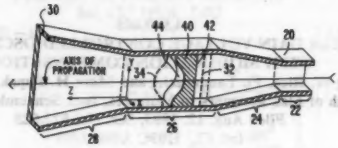
an artificial skin effect layer adjacent said magnetic composite layer for increasing the inductance of said magnetic composite layer and conductor combination.

4,510,469

SELECTIVE WAVEGUIDE MODE CONVERTER

David F. Bowman, Moorestown, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 31, 1983, Ser. No. 499,395
Int. Cl.³ H01P 1/16
U.S. Cl. 333—21 R **8 Claims**



1. A waveguide mode converter for performing mode conversion between an incident wave and an emergent wave, each of said waves being propagated in at least a first mode and at least one of said waves propagating in at least one additional mode which is a higher order mode than said first mode, said mode converter comprising:

a waveguide having an axis of propagation; and

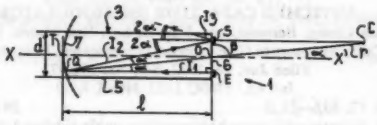
a mode conversion body disposed within said waveguide, said mode conversion body having a different effective dielectric constant (EDC) than adjacent regions within said waveguide, said mode conversion body having a thickness parallel to said axis of propagation and an EDC/thickness profile which varies across said waveguide in a manner which is effective for producing a phase displacement in said incident propagating wave which is in phase quadrature with said incident wave and has an amplitude profile across said waveguide which is proportional to the amplitude profile across said waveguide of said at least one additional propagating mode.

4,510,470

ELECTRO-ACOUSTIC DELAY LINE OPERATING IN TRANSMISSION

Jean C. Resneau; Jean Puyhaubert; Evelyne Da Silva, and Claude Lamontagne, all of Paris, France, assignors to Thomson CSF, Paris, France

Filed Feb. 22, 1983, Ser. No. 468,598
Claims priority, application France, Feb. 26, 1982, 82 03263
Int. Cl.³ H03H 9/36
U.S. Cl. 333—142 **9 Claims**



1. An electro-acoustic delay line operating in transmission, comprising:

an acoustic wave propagation medium having a longitudinal axis and being delimited by at least one lateral surface, a first plane terminal surface and a second terminal surface of revolution ensuring a focusing of said acoustic wave;

an input transducer and an output transducer transforming an electromagnetic wave into an acoustic wave and vice versa, said two transducers being positioned on said plane terminal surface and being symmetrical with respect to the middle of said plane surface, the acoustic wave produced by said input transducer being perpendicular to said plane terminal surface; wherein the angle formed by the axis of revolution of said second terminal surface passing through

the middle of said plane terminal surface and the acoustic wave produced by said input transducer has a value such that said acoustic wave undergoes a single reflection on said focusing surface of revolution and such that the acoustic wave reflected on said surface of revolution is concentrated at the level of said output transducer, thus allowing the obtainment of a single echo delayed signal.

4,510,471

ACOUSTIC SURFACE WAVE DEVICE INCLUDING A REFLECTIVE MULTISTRIP COUPLER

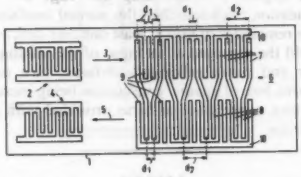
Ian Flinn, deceased, late of Crawley (by Heather Anne Flinn, executrix), and Robert Murray, Horley, both of England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 1, 1983, Ser. No. 510,093

Claims priority, application United Kingdom, Jul. 5, 1982, 8219373

Int. Cl.³ H03H *9/145, 9/64*

U.S. Cl. 333—195 **16 Claims**



1. An acoustic surface wave device comprising a piezoelectric substrate for propagating an acoustic surface wave at a surface thereof, transducer means for launching acoustic surface wave energy so as to propagate over said surface and for converting acoustic surface wave energy propagating over said surface into an electrical signal, and electrical coupling means for receiving acoustic surface wave energy propagating along a first propagation track and relaunching at least part of that energy as acoustic surface wave energy along a second propagation track, said electrical coupling means comprising a first array of electrically conductive strips across said first track and a second array of electrically conductive strips across said second track, each array including discrete parallel electrically conductive strips each of which is electrically insulated from the other said discrete conductive strips of that array and is electrically connected to a respective said discrete conductive strip of the other array such that the successive said discrete conductive strips of each array are electrically connected to the successive said discrete conductive strips of the other array, the centre-to-centre spacings of the successive said discrete conductive strips of each array being alternately relatively large and relatively small, the said discrete conductive strips of the two arrays being interconnected such that, in each array, the said discrete conductive strips of each pair which have a said relatively large centre-to-centre spacing are connected to the respective strips of a pair in the other array which have a said relatively small centre-to-centre spacing, characterised in that each array includes a plurality of further electrically conductive strips which are parallel to the said discrete conductive strips of that array, in that said further strips are situated between the respective discrete conductive strips forming substantially every pair having a said relatively large centre-to-centre spacing, and in that all said further electrically conductive strips in both said arrays are electrically interconnected.

4,510,472

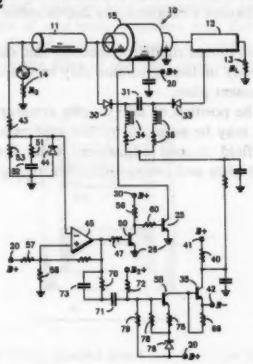
HIGH POWER RF RELAY SWITCH TRIGGER

Robert H. Bickley; Charles A. Bucher, both of Scottsdale, and David M. Yee, Phoenix, all of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jul. 5, 1983, Ser. No. 510,716

Int. Cl.³ H01P *1/10, 1/15*

U.S. Cl. 333—262 **8 Claims**



1. In a high power RF switch of the type including a relay connected to carry the input high power RF and having at least two pin diodes connected in opposed polarity relationship in parallel with the relay, trigger apparatus for operating the two pin diodes comprising:

detector means coupled to receive the input high power RF and supply a detected output signal in response thereto:

comparator means, having an input coupled to the output of said detector means, a reference level input and an output, for supplying an output signal at the output thereof whenever the detected output signal exceeds the reference level; and

a one shot circuit coupled to the output of said comparator means and having an output coupled to the two pin diodes for causing the pin diodes to conduct high power RF only for a predetermined length of time after the output signal is supplied by said comparator means.

4,510,473

ELECTROMAGNETIC RELAY

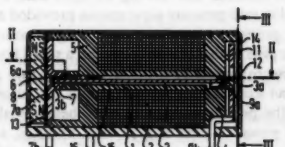
Josef Schweiger, and Bernhard Hering, both of Munich, Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Sep. 23, 1983, Ser. No. 535,348

Claims priority, application Fed. Rep. of Germany, Oct. 29, 1982, 3240215

Int. Cl.³ H01H *51/27*

U.S. Cl. 335—86 **5 Claims**



1. An electromagnetic relay comprising:

a hollow coil body having two end flanges and a central section therebetween about which a coil having a coil axis is wound;

at least one pole piece disposed at one of said flanges;

a tongue armature extending through said coil body substantially along said coil axis having a free end movable relative to said pole piece and a fixed end;

a carrier plate disposed substantially perpendicular to said coil axis at the other end of said coil flanges to which said fixed end of said tongue armature is attached, said carrier plate having a magnetically displaceable adjustment plate; and

a securing means rigidly connecting said carrier plate to said coil body including torsion stay means connected to said adjustment plate,

whereby the position of said tongue armature relative to said pole plate may be adjusted by the application of an external magnetic field to said adjustment plate for displacing said adjustment plate and permanently deforming said torsion stay means.

4,510,474

INDUCTIVE PICKUP FOR FLUID CONTROL ELEMENT

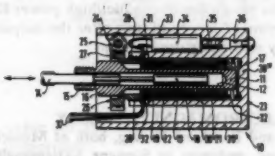
Roman Romes, Friolzheim; Wolfgang Schilling, Schwieberdingen, and Jürgen Werner, Moglingen, all of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jun. 11, 1982, Ser. No. 387,518

Claims priority, application Fed. Rep. of Germany, Jul. 11, 1981, 3127470

Int. Cl.³ H01F *21/06*

U.S. Cl. 336—30 **15 Claims**



1. A pressure medium-tight inductive pickup for a fluid control element, particularly for a displacement, pressure or flow valve, comprising a pressure pipe composed of a non-magnetic material and having an open end; a magnetic core received in said pressure pipe; means provided at said open end of said pressure pipe for pressure-tight connection of said pressure pipe with a control element; a spool body surrounding said pressure pipe; a housing surrounding said spool body and having an axis; and adjustment means for adjusting zero position of the pickup, said spool body being axially displaceable on said pressure pipe and in said housing, said adjustment means being formed as a worm drive adjustable from outside and coupled with said spool body so that the latter is play-free in an axial direction, said worm drive of said adjusting means including a worm and a worm wheel arranged adjacent to said open end of said pressure pipe and so that said worm extends in said housing transverse to said pressure pipe, whereas said worm wheel extends in said housing concentric to said pressure pipe and transverse to said worm.

4,510,475

DISK COIL WINDING OF INTERWOUND SINGLE OR DOUBLE COILS

Gottfried Broszat, Waiblingen-Hegnach, Fed. Rep. of Germany, assignor to Transformatoren Union Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Feb. 8, 1982, Ser. No. 346,880

Claims priority, application Fed. Rep. of Germany, Feb. 13, 1981, 3105317

Int. Cl.³ H01F *27/08, 15/14*

U.S. Cl. 336—60 **12 Claims**

1. Disk coil winding comprising interwound disk coils formed of conductor turns having normal insulation thereon, the spacing of only two outermost and only two innermost turns of at least one disk coil being greater than the spacing between turns in the remainder of said at least one disk coil, auxiliary insulations only on said two outermost and two innermost turns angularly surrounding one edge and providing greater insulation thickness than the normal insulation on said turns in the remainder of said at least one disk coil, said at least one disk coil the disposed at an input of the winding, starting from inner and outer generated surfaces, turn capacitance between turns free of auxiliary insulation being increased with respect to turn capacitance at turns provided with said auxiliary insulations.

4,510,476

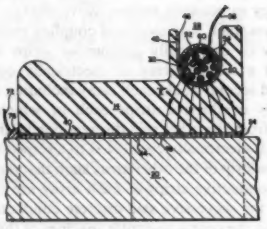
HIGH VOLTAGE ISOLATION TRANSFORMER

Carroll H. Clatterbuck, Silver Spring, and Arthur P. Ruitberg, Germantown, both of Md., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Jun. 21, 1983, Ser. No. 506,477

Int. Cl.³ H01F *15/04*

U.S. Cl. 336—84 C **16 Claims**



1. An isolation transformer, comprising:

core means (16) for concentrating lines of magnetic flux in a ferromagnetic path including a pair of legs (18, 20);

a pair (12, 14) of electrically insulating means encircling different ones of said legs;

coating means (47, 48) having a first electrical conductivity adhering to said insulating means for separating said insulating means from said concentrating means;

primary (30) and secondary (32) electrical conducting means having a second and greater electrical conductivity wound around different ones of said insulating means for generating a magnetic flux in said legs; and

other coating means (49,59,50,60) having said first electrical conductivity for encasing respective ones of said primary

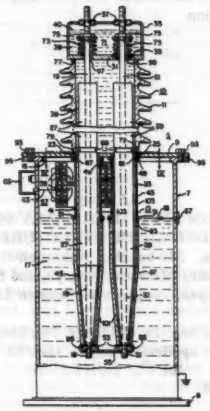
and secondary conducting means to separate said conducting means from said insulating means.

4,510,477

CURRENT TRANSFORMER

Joseph R. Rostron, Franklin Township, and John R. Perulfi, Monroeville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 19, 1983, Ser. No. 543,644
Int. Cl.³ H01F *27/02*
U.S. Cl. 336—92 **7 Claims**



1. A current transformer comprising:
(a) a transformer tank having a cover on the tank forming a first chamber of a first oil system;
(b) a pair of elongated conductors extending through the cover and into the tank with each conductor having external and internal end portions within the tank;
(c) tubular shell means around each conductor forming separate and intercommunicating portions of a second chamber of a second oil system;
(d) a connector interconnecting the internal end portions of the conductors;
(e) the assembly of the pair of conductors and the connector forming primary conductor means;
(f) a magnetic core in inductive relation with windings around the primary conductor means; and
(g) said cover forming a common interface between the first and second oil systems to enable separate assembly of the second oil system prior to its placement in the tank.

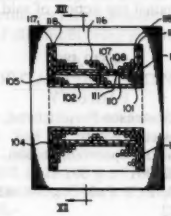
4,510,478

COIL BODY

Ernest Finkbeiner, Grayslake, Ill., assignor to Mid-West Transformer Company, Grayslake, Ill.

Division of Ser. No. 293,199, Aug. 17, 1981, Pat. No. 4,405,913. This application May 18, 1983, Ser. No. 495,647
Int. Cl.³ H01F *27/30*
U.S. Cl. 336—198 **2 Claims**

1. An electrical coil of the type having primary and secondary windings wrapped on a coil body, the coil body including a hollow core defining tube member having outwardly projecting axial end walls at axial ends thereof defining a winding area between the axial end walls and radially outwardly of the tube, primary and secondary windings received in the coil winding area, said primary and secondary windings being concentric and radially spaced from one another, dividing members for dividing the primary and secondary winding areas, said dividing members comprising two body members, each of said body members being U-shaped in cross section with the section taken normal to the axis of the tube, the body members being received in opposed overlapping relationship with the bights of each of the body members lying on opposite sides of the tube, the body members received around one of said primary or secondary coils and being radially spaced from said tube, each of the body members consisting of a bight and two projecting legs, one of said body members being dimensioned to be received with its legs substantially completely interior of the other of said body members with the bights of said one and said other of said body members being opposed to one another on opposite sides of the tube, with the legs of the



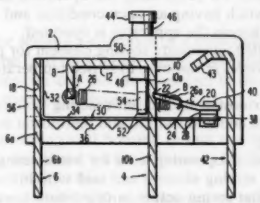
one body member being spaced apart less than the legs of the other body member and being inserted between the legs of said other body member in full telescoping relationship, each of said legs and bights having a cross section in a plane parallel to the axis of the tube which is U-shaped with said leg and said bight forming the bight of the cross section in the plane parallel to the tube and having outwardly projecting leg portions extending therefrom adjacent axial ends thereof terminating equal distance from the axis of said tube with the outer periphery of the axial end walls of said tube defining a second winding area therein, the other of said primary and said secondary coils wound in said second winding area.

4,510,479

PC-BOARD MOUNTED THERMAL BREAKER

Donald K. Merchant, Cambridge, Md., assignor to Airpax Corporation, Cambridge, Md.

Continuation-in-part of Ser. No. 480,285, Mar. 30, 1983, abandoned. This application Nov. 10, 1983, Ser. No. 550,462
Int. Cl.³ H01H *61/00, 71/16*
U.S. Cl. 337—91 **28 Claims**



7. A circuit breaker, comprising:
an electrically insulating housing having a sawtooth surface formed in the lower portion thereof;
first and second terminal means extending through said housing for connecting the breaker to an electrical circuit;
a bimetallic element located in said housing and electrically coupled to said first terminal, wherein said bimetallic element rests on said sawtooth surface when not in a deformed state;
a first contact member coupled to said bimetallic element;
a second contact member located in said housing and electrically coupled to said second terminal;
means for mounting said second contact member for move-

ment into and out of contact with said first contact member; and

biasing means coupled to said second contact member to alternately bias said second contact member in opposite directions between first and second positions, wherein in said first position, said second contact member is biased into electrical contact with said first contact member, and in said second position, said second contact member is biased out of electrical contact with said first contact member;

said bimetallic element being deformed upon application of a sufficient overcurrent therethrough to move said second contact member from said first position toward said second position against the action of said biasing means.

4,510,480

THERMOSTAT WITH TEMPERATURE PULL-DOWN FACILITY

Guglielmo Rossi, D-Stutensee-Freidrichstal, and Mario Gemma, Linkenheim-Hochstetten, both of Fed. Rep. of Germany, assignors to Ranco Incorporated, Dublin, Ohio

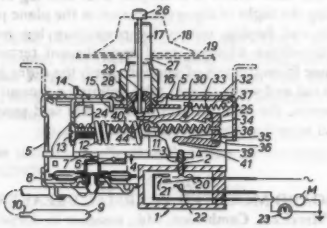
PCT No. PCT/GB82/00171, § 371 Date Feb. 7, 1983, § 102(e) Date Feb. 7, 1983, PCT Pub. No. WO82/04497, PCT Pub. Date Dec. 23, 1982

PCT Filed Jun. 9, 1982, Ser. No. 465,859

Claims priority, application United Kingdom, Jun. 9, 1981, 8117560

Int. Cl.³ H01H *37/38*

U.S. Cl. 337—321 **14 Claims**



1. A thermostat unit for a refrigeration or freezer apparatus comprising:

(a) a switch for controlling the operation of the apparatus, said switch having an open condition and a closed condition wherein the apparatus is operated;

(b) a single temperature sensing element for producing actuating forces in response to sensed temperature in the apparatus;

(c) a thermostat mechanism reacting between said sensing element and said switch, said thermostat mechanism comprising:

(i) a switch operating lever for transmitting force between said sensing element and said switch;

(ii) a first spring acting in opposition to said sensing element; and

(iii) adjustment means for adjusting the force of said first spring to adjust the normal working temperature of the apparatus between upper and lower limits; and

(d) rapid refrigeration means for closing said switch to cause continuous operation of said apparatus until said sensing element senses an apparatus temperature below said lower limit of said normal working temperature, said rapid refrigeration means comprising:

(i) a latch mechanism;

(ii) a pre-loaded element which is normally retained by the latch mechanism in an inoperative position, said pre-loaded element movable to an operative position of engagement with said thermostat mechanism;

(iii) a second spring acting upon the pre-loaded element and effective, when said pre-loaded element is in said operative position, to oppose said first spring for effecting closure of said switch at sensed temperatures within said normal working temperature range; and

(iv) a push-button connected to the latch mechanism to trip the latter upon manual operation of the push-button to release the pre-loaded element into the operative position;

(e) said thermostat mechanism effective, in response to a sensed temperature below said normal working temperature lower limit, to return said pre-loaded element to said inoperative position, relatching said pre-loaded element and said latch mechanism and returning said switch to said open condition.

4,510,481

SNAP ACTION TYPE THERMALLY RESPONSIVE SWITCHING STRUCTURE

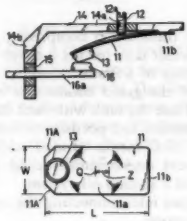
Susumu Ubukata, 549-banchi, Nakasuna-cho, Tempaku-ku, Nagoya; Yasukazu Mizutani, Nagoya, and Syozo Iyoda, Nagoya, all of Japan, assignors to Susumu Ubukata, Nagoya, Japan

Filed Sep. 29, 1983, Ser. No. 536,999

Claims priority, application Japan, Oct. 12, 1982, 57-178628

Int. Cl.³ H01H *37/20*

U.S. Cl. 337—368 **5 Claims**



1. A snap action type thermally responsive switching structure comprising;

a fixed contact secured via a suitable support blade to a stationary means in electrically insulated relationship therewith;

a thermally responsive element which is formed into a generally rectangular shape with a substantially circular dish-shaped portion therein, the element being secured at one lengthwise end to said stationary means, and a movable contact carried at the other end to make and break contact against said fixed contact when snapped in response to the temperature,

said thermally responsive element being determined by the ratio of its length to its width to be two or more than two; and

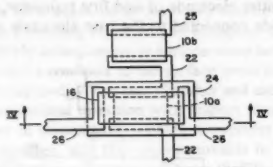
a calibrator means provided with said stationary means to project toward the convex side of said dish-shaped portion so as to depress thereagainst at the normal temperature,

said calibrator means being positioned to contact said dish-shaped portion within the region defined between its central point and a point spaced away from said central point in a lengthwise direction equal to one-third of the width of the said thermally responsive element toward the secured end thereof.

4,510,482
PROTECTIVE CIRCUIT FOR ELECTRONIC TEST PROBES

John B. McClanahan, Hillsboro; Marvin E. LaVoie, Aloha; Wayne E. Kelsoe, Beaverton, and James Wrobel, Banks, all of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Dec. 15, 1982, Ser. No. 449,900
Int. Cl.³ G01K 7/16; H02H 5/04
U.S. Cl. 338—24 4 Claims

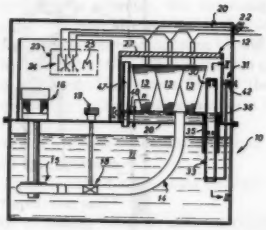


1. An electrical device comprising:
a dielectric substrate;
an input terminal formed upon said dielectric substrate for receiving an input signal having a potential different from a ground potential level,
a load resistor formed upon said dielectric substrate and connectable between said input terminal and the ground potential level, said load resistor including at least two load resistor portions connected together and having a combined resistance equal to a desired value, wherein said load resistor is constituted by a first film of resistive material formed on a main face of the dielectric substrate in first and second discrete portions, corresponding to said first and second load resistor portions respectively,
a temperature sensitive member in good thermally conductive contact with one, but not all, of said load resistor portions, said temperature sensitive member being constituted by a second film of resistive material formed on a main face of the substrate,
switch means which are actuable to isolate the load resistor from the input terminal, and
a protective circuit connected to and operable by said temperature sensitive member for actuating said switch means.

4,510,483
LIQUID RHEOSTAT FOR STARTING AN ELECTRIC MOTOR WITH IMPROVED SILL STRUCTURE

Michel Bensadoun, Couzeix, France, assignor to Electricite de France Service National, Paris, France

Filed Aug. 5, 1983, Ser. No. 520,849
Claims priority, application France, Aug. 23, 1982, 82 14474
Int. Cl.³ H01C 10/02
U.S. Cl. 338—80 13 Claims

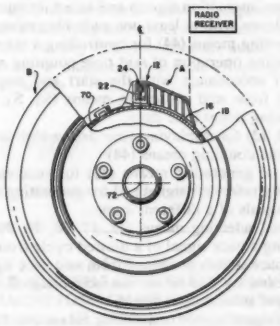


1. A variable-level liquid rheostat for starting an electric motor, comprising a tank which contains electrolyte, a starting chamber which is arranged above said tank, electrodes arranged in the upper part of said starting chamber, connecting terminals adapted to link said electrodes with the excitation circuit of the motor to be started, a feed pipe fitted between said tank and said starting chamber for the introduction of electrolyte into said chamber, a discharge sill arranged in said starting chamber and adapted to limit, at least temporarily, the level of electrolyte therein, wherein said discharge sill is mounted adjustably in height in the starting chamber under the control of an actuating means available to the user, said discharge sill is formed by the conjuction of two mutually nested coaxial tubes which each contains a slot and of which at least one is mounted rotatably about the axis of the assembly under the control of the actuating means available to the user, and the slot of at least one of said tubes being generally oblique relative to said axis.

4,510,484
PIEZOELECTRIC REED POWER SUPPLY FOR USE IN ABNORMAL TIRE CONDITION WARNING SYSTEMS

Daniel S. Snyder, Norwalk, Ohio, assignor to Imperial Clevite Inc., Glenview, Ill.

Filed Mar. 28, 1983, Ser. No. 479,504
The portion of the term of this patent subsequent to May 24, 2000, has been disclaimed.
Int. Cl.³ B60C 23/02
U.S. Cl. 340—58 9 Claims

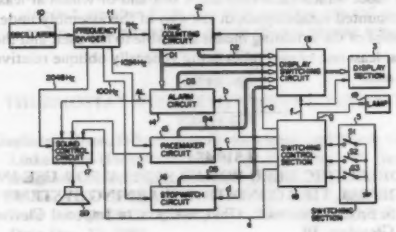


1. A device for sensing a condition of a pneumatic tire preferably of the type used on a motor vehicle wherein the tire is mounted on a tire rim and the tire is subject to normal wheel vibrations, said device comprising:
a housing;
a means for mounting said housing to said tire rim;
sensing means associated with said housing for monitoring a condition within the tire;
circuit means associated with said housing including a radio transmitter circuit operatively connected to said sensing means for generating radio signals indicative of said tire condition;
power supply means associated with said housing operatively connected to said circuit means, said power supply means including a piezoelectric reed having a base portion and an end portion, said base portion being fixedly attached to said housing, and a tuning mass member mounted to said end portion, said power supply further including opposed stop members spaced from said tuning mass member to permit flexure of said reed therebetween, said stop members and said tuning mass member being configured for mating abutment to inhibit compound bending of said reed during flexure; and
means for receiving said radio signals.

4,510,485
SOUND GENERATING DEVICE FOR JOGGER

Iwao Tahara, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 361,473, Mar. 23, 1982, abandoned.
This application Aug. 21, 1984, Ser. No. 643,089
Claims priority, application Japan, Mar. 31, 1981, 56-47992; Mar. 31, 1981, 56-47999; Mar. 31, 1981, 56-48003
Int. Cl.³ G08B 23/00
U.S. Cl. 340—323 R 5 Claims



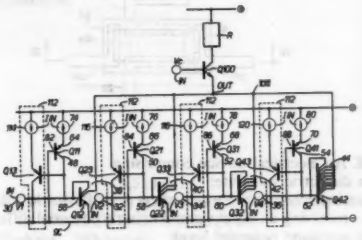
1. A sound generating device for a jogger, comprising:
reference signal generating means (10, 11) for generating frequency-divided time counting reference signals;
switching means (S_2, S_3, 18) for selectively supplying start and stop instruction signals and select instruction signal in accordance with at least one switching operation;
time counting means (44) for controlling a start and stop of a counting operation of said time counting reference signals in accordance with the start and stop instruction signals from said switching means (S_2, S_3, 18) and for producing count time data;
means (3, 13) for displaying time data which is output from said time counting means (44);
pace signal generating means (41) for receiving said time counting reference signal and for generating a plurality of pace signals of a different cycle;
pace signal selecting means (42, 47, 48, 49, 50, 51, 55) for selecting a pace signal of a desired cycle from said plurality of pace signals produced from said pace signal generating means, by said select instruction signal, and for producing it as an output signal;
first pace signal supply controlling means (46, 56) connected to said pace signal selecting means for producing the selected pace signal as a desired signal in accordance with said start instruction signal;
sound generating means (17, 20) for receiving said desired pace signal from said first pace signal supply controlling means and for generating a pace sound; and
a second pace signal supply controlling means (71, 72) connected to said pace signal selecting means for supplying said desired pace signal to said sound generating means when said pace signal selecting means is operated upon receipt of said select instruction signal.

4,510,486
DIGITAL-TO-ANALOG CONVERTER

Katsumi Nagano, Hiratsuka, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Apr. 26, 1982, Ser. No. 372,009
Claims priority, application Japan, Apr. 25, 1981, 56-63007
Int. Cl.³ H03K 13/02
U.S. Cl. 340—347 DA 3 Claims

1. A digital-to-analog converter which converts an input digital signal consisting of a plurality of bits into an analog output signal comprising:
a plurality of stages equal in number to the number of bits of said input digital signal, each stage having an input terminal and an output terminal respectively, including:
(a) a first transistor having a base, an emitter, and a plurality of collector electrodes, one of said collector electrodes being connected to said base electrode, the remaining collector electrodes being connected to said output terminal, and the base electrode being connected to said input terminal,
(b) a first reference voltage source connected to the emitter electrode of said first transistor,
(c) current means including a first current source and a second transistor having a base electrode connected to the emitter electrode of said first transistor, a collector electrode connected to the base electrode of said first

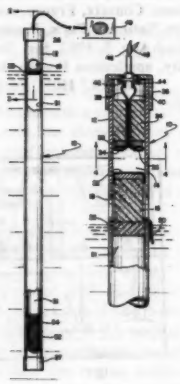


transistor, and an emitter electrode connected to said first current source, and
(d) an α-adjusting circuit including a second current source and a third transistor having a base electrode connected to the collector electrode of said second transistor, a collector electrode connected to the emitter electrode of said first transistor, and an emitter electrode connected to the second current source,
each of said bits of said input signal being applied to a respective input terminal of said plurality of stages and the respective output terminals of said stages being connected together to produce said analog output signal.

4,510,487
POOL ALARM

Earle C. Wolfe, deceased, late of Marion (by M. Christine Wolfe, administrator); William G. Jobsky, Hopedale, both of Mass., and Thomas P. Smith, Miami, Fla., assignors to Aaron Alarm Systems, Inc., New Bedford, Mass.

Filed Mar. 10, 1982, Ser. No. 356,831
Int. Cl.³ G08B 21/00
U.S. Cl. 340—566 13 Claims



1. A switching device for effecting electrical continuity in an alarm circuit in response to wave motion in a fluid comprising:

a. an elongated member having an open interior chamber adjacent an end thereof and a passage which provides communication between said chamber and the exterior of said device, said elongated member being floatable in said fluid with the top portion of said chamber above the surface of said fluid and with the lower portion of said elongated member extending to a depth of at least two feet beneath the surface of said fluid, whereby said elongated member is responsive to wave motion in said fluid which extends to a depth of at least two feet in said fluid to provide a bobbing effect on said elongated member but it is relatively unresponsive to surface wave motion which is substantially confined to the surface areas of said fluid;

b. a float disposed within said chamber and movable therein in a longitudinal direction with respect to said elongated member in response to bobbing movement of said elongated member, said float being movable in said chamber between lower and upper positions therein; and

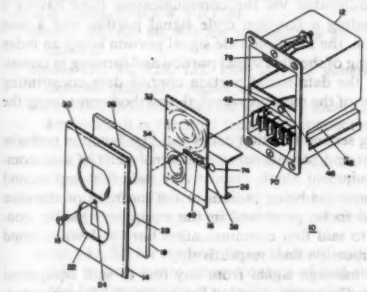
c. sensing means in said chamber responsive to movement of said float from said lower position to said upper position to effect continuity in said alarm circuit.

4,510,488

PASSIVE INFRARED INTRUSION DETECTOR

Herbert N. St. Jean, New Milford, and Richard Settanni, Bethel, both of Conn., assignors to Cerberus AG, Switzerland

Filed Feb. 10, 1982, Ser. No. 347,633
Int. Cl.³ G01J 1/00
U.S. Cl. 340—567 **19 Claims**



1. An infrared intrusion detector, for mounting within a wall, and arranged to resemble an electrical outlet, comprising:

an enclosure for insertion into an opening in said wall;

a cover plate for mounting to said enclosure, said cover plate having first and second apertures formed therein, said apertures resembling corresponding apertures in an electrical outlet cover plate;

an infrared radiation detector, mounted in said enclosure adjacent said first aperture;

a first light source, mounted within said enclosure adjacent said second aperture; and

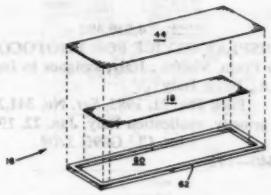
a lens unit, for mounting between said enclosure and said cover plate, said lens unit including a first lens, for focusing infrared radiation from a region of space and passing through said first aperture onto said detector and a second lens, for focusing light emitted by said light source into a light beam corresponding to said region of space.

4,510,489

SURVEILLANCE SYSTEM HAVING MAGNETOMECHANICAL MARKER

Philip M. Anderson, III, Chatham; Gerald R. Bretts, Livingston, both of N.J., and James E. Kearney, New Hyde Park, N.Y., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Filed Apr. 29, 1982, Ser. No. 373,061
Int. Cl.³ G08B 13/26
U.S. Cl. 340—572 **32 Claims**



1. For use in a magnetic article surveillance system, a marker adapted to (i) mechanically resonate at a single frequency provided by an incident magnetic field applied within an interrogation zone, and (ii) undergo a substantial change in effective magnetic permeability at said frequency that provides said marker with signal identity, said marker comprising a strip of magnetostrictive ferromagnetic material adapted to be magnetically biased and thereby armed to resonate at said frequency, said strip having a magnetomechanical coupling factor, k, greater than 0, where

$$k = \sqrt{(1 - f_r^2/f_a^2)} ,$$

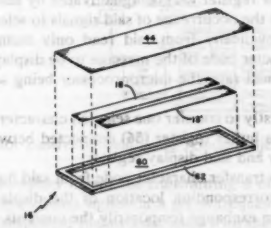
f_r and f_a being the resonant and anti-resonant frequencies, respectively.

4,510,490

CODED SURVEILLANCE SYSTEM HAVING MAGNETOMECHANICAL MARKER

Philip M. Anderson, III, Chatham, N.J.; James E. Kearney, New Hyde Park, N.Y., and Gerald R. Bretts, Livingston, N.J., assignors to Allied Corporation, Morris Township, Morris County, N.J.

Continuation-in-part of Ser. No. 373,061, Apr. 29, 1982,. This application Jun. 3, 1982, Ser. No. 384,814
Int. Cl.³ G08B 13/26
U.S. Cl. 340—572 **33 Claims**



1. For use in a magnetic article surveillance system, a marker adapted to (i) mechanically resonate at preselected frequencies provided by an incident magnetic field applied within an interrogation zone, and (ii) undergo a substantial change in effective magnetic permeability at each of said preselected frequencies that provides said marker with signal identity, said marker

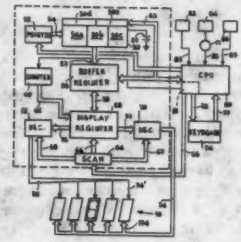
comprising a plurality of strips of magnetostrictive ferromagnetic material, each of said strips being adapted to be magnetically biased and thereby armed to resonate at a single, different one of said preselected frequencies, and having a magnetomechanical coupling factor, k, greater than 0, where $k=\sqrt{(1-f_r^2/f_a^2)}$, f_r and f_a being the resonant and antiresonant frequencies, respectively.

4,510,491

DISPLAY DEVICE FOR PHOTOCOPIERS

Francesco Prato, Vialfré , Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy

Filed Jan. 21, 1982, Ser. No. 341,220
Claims priority, application Italy, Jan. 22, 1981, 67070 A/81
Int. Cl.³ G09G 3/04
U.S. Cl. 340—792 **7 Claims**



1. A display device for displaying control messages on a photocopier, comprising

a microprocessor unit (80) arranged to handle program instructions and including a read only memory (50) permanently loaded with the character codes of said control messages,

a multicell display unit, selectively actuated by said microprocessor to cyclically display said messages,

a display register connected to said display unit to contain said characters to be displayed,

sensing means responsive to predetermined operating conditions of said photocopier for supplying the microprocessor with activations signals,

means cyclically shifting the actuation of the cells of said multicell display unit, each cell being of the seven segment type and adapted to be directly actuated by said character codes, and

a pointer register (52) being activated by said microprocessor at the occurrence of said signals to select successively and cyclically from said read only memory (50) each character code of the message to be displayed at a predetermined rate, the microprocessor being so programmed as

(a) firstly to transfer one selected character code at a time to a buffer register (56) connected between said memory and said display register,

(b) to transfer character code from said buffer register to a corresponding location of the display register and then exchange temporarily the contents of all the locations of said display register back to said buffer register, and again

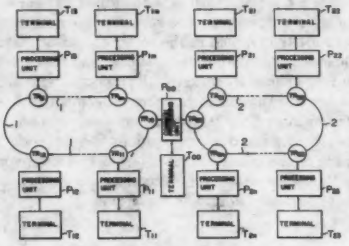
(c) to transfer the contents of the buffer register to the display register in locations shifted by one position whereby all character codes of the message to be displayed are shifted successively and cyclically across the locations of the display register.

4,510,492

MESSAGE COMMUNICATION METHOD AND SYSTEM

Kinji Mori, Kawasaki; Makoto Nohmi, Sagamihara; Shoji Miyamoto, Kawasaki; Hirokazu Ihara, Machida; Hiroshi Matsumaru, Katsuta, and Katuaki Ikeda, Hachioji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 8, 1982, Ser. No. 366,782
Claims priority, application Japan, Apr. 8, 1981, 56-51786
Int. Cl.³ H04Q 9/00; H04J 3/08
U.S. Cl. 340—825.05 **6 Claims**



1. A message communication method in a network system including a plurality of communication lines a plurality of intra-line equipment blocks and at least one common equipment block, each of said intra-line equipment blocks being connected to one of said communication lines, at least a first one of said communication lines being coupled to at least a second one of said communication lines through a common equipment block which is connected to both of the coupled first and second communication lines, said common equiment block having a first network control unit connected to said first communication line and a second network control unit connected to said second communication line, each message signal to be communicated via the communication lines having a format including a function code signal portion and a data signal portion, the function code signal portion being an index to the meaning of the data signal portion and forming in combination with the data signal portion control data constituting the substance of the message signal, the method comprising the steps of:

registering second function codes and first function codes in said first and second network control units of said common equipment block, respectively, said first and second function codes being indices to the meaning of the data required to be processed in the equipment blocks connected to said first communication lines and said second communication line, respectively;

sending a message signal from any one of said equipment blocks to the communication line to which it is connected;

receiving message signals in said common equipment block from said coupled communication lines;

comparing in said first and second network control units of said common equipment block the function code signal portions of received message signals with those ones of said second and first function codes having been registered in said first and second network control units, respectively, which are indices to the meaning of data required to be processed by one of the equipment blocks connected to one of the coupled communication lines with which said sending equipment block is not connected;

tranferring the received message from one of said coupled communication lines to the other only when said comparison results in concurrence; and

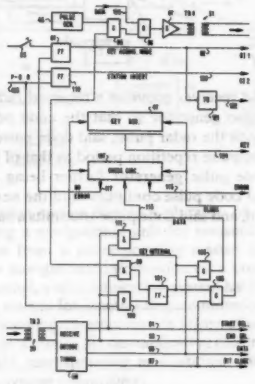
receiving a message signal in any of said equipment blocks only when one of the function codes registered in said receiving equipment block is concurrent with the function code signal portion of the message signal received on the communication line to which the receiving equipment block is connected.

4,510,493

METHOD AND ARRANGEMENT FOR LOCAL ADDRESS ACQUISITION BY A STATION IN A COMMUNICATION SYSTEM

Werner K. Bux, Richterswil; Heinrich J. Keller, Ruschlikon, and Hans R. Mueller, Langnau, all of Switzerland, assignors to International Business Machines Corp., Armonk, N.Y.

Filed Nov. 12, 1982, Ser. No. 440,935
Claims priority, application European Pat. Off., Dec. 29, 1981, 81.11.0820.8
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—825.05 10 Claims



4. Arrangement for loading a local identification key into a station when it is connected to a transmission network by a connecting port, characterized in that it comprises

in said station (FIG. 4, FIG. 5):

means (45, 85, 86, 87) for transmitting an idling signal pattern,

means (81, 82, 129, 131, 135, 137) for generating a key demand indication signal, and

means (47, 101, 103, 105) for storing a local identification key when it is received from said connecting port;

in said connecting port (FIG. 3):

means (51) for storing a local identification key for the respective port,

means (39, 55, 57) for deriving a timing signal from an idling signal pattern received from a station being connected, and

means (43, 53) for reading the local identification key from said storing means under control of said timing signal and for transmitting it to said station when said demand indication signal is received.

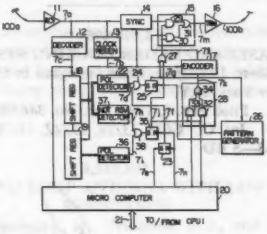
4,510,494

LOOP TYPE DATA HIGHWAY SYSTEM

Sadao Mizokawa; Takuji Hamada; Hiroshi Tomizawa, and Hitoshi Fushimi, all of Hitachi, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 6, 1982, Ser. No. 395,327
Claims priority, application Japan, Jul. 6, 1981, 56-104483
Int. Cl.³ H04Q 9/00
U.S. Cl. 340—825.05 4 Claims

1. A loop type data highway system in which a plurality of stations are connected in cascade to a loop transmission line so that any station may transmit data on said transmission line to another station in response to receipt of a polling frame inquiring of a need by the station for reservation of said transmission for exclusive use in transmitting data, said polling frame including at least a first polling field and a second field indicating reservation status; wherein each of said stations comprises first means for receiving signals on said transmission line from the station located upstream therefrom on said line and for repeating sequentially the received signals on said transmission line to the station located downstream therefrom on said line; second means responsive to detection of the first field of the polling frame in the received signal to generate a reservation signal pattern indicative of the line being reserved when the station has a need for reservation of the line and for causing said generated reservation signal pattern to be sent out by said first



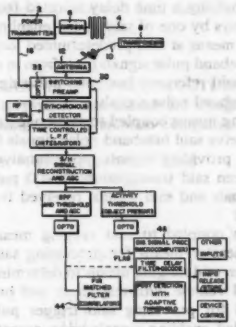
means without delay in place of the second field of the received polling frame on the transmission line downstream of said station; third means for providing data to be sent on said transmission line to another station; and fourth means responsive to detection of the second field of said received polling frame indicative of the line being non-reserved for causing said first means to sent out on said transmission line said data provided by said third means subsequent to the sending out of said generated reservation pattern.

4,510,495

REMOTE PASSIVE IDENTIFICATION SYSTEM

Nick A. Sigrimis, Athens, Greece, and Norman R. Scott, Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Aug. 9, 1982, Ser. No. 406,471
Int. Cl.³ H04Q 9/00; G01S 9/56
U.S. Cl. 340—825.54 15 Claims



1. A system for passively identifying remote objects, comprising

(a) power transmitter means for transmitting a plurality of radio frequency burst signals at a given frequency;

(b) passive transponder means associated with the object to be identified, said transponder means producing a plurality of uniquely coded identification signals at said given frequency in response to said burst signals;

(c) receiver means for receiving said uniquely coded identification signals from said transponder means to identify the object; and

(d) time division multiplexing means for alternately operat-

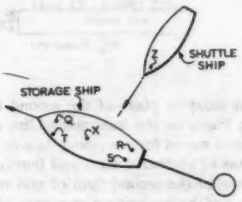
ing said transmitter and receiver means, whereby when the object is to be identified, said transmitter means transmits said burst signals for a limited period of time, thereby activating said transponder means to produce said uniquely coded identification signals, said time division multiplexing means operable to switch off said transmitter means following transmission and to switch on said receiver means to receive said uniquely coded identification signals from said transponder for identifying the object.

4,510,496

BASEBAND RADAR DOCKING SYSTEM

Gerald F. Ross, Lexington, Mass., assignor to Sperry Corporation, New York, N.Y.

Filed Feb. 8, 1982, Ser. No. 346,700
Int. Cl.³ G01S *13/14, 13/42, 13/70*
U.S. Cl. 343—5 BD **12 Claims**



1. A system for guiding a vehicle to a predetermined position at a predetermined location comprising:

means on said vehicle responsive to a sequence of first trigger pulses for transmitting a sequence of reference baseband pulse signals;

means on said vehicle and responsive to second trigger pulses for generating a sequence of coded enabling signals;

means on said vehicle responsive to said sequence of first trigger pulses and said coded enabling signals for transmitting a plurality of position baseband pulse signals time delayed with respect to said reference baseband pulse signals by a time delay selected from a plurality of time delays by one of said coded enabling signals;

relay means at said predetermined location for transmitting baseband pulse signals therefrom in response to receptions of said reference baseband pulse signals and said position baseband pulse signals;

ranging means coupled to said code generator means and to receive said baseband pulse signals from said relay means for providing signals representative of transit times between said transmission of said position baseband pulse signals and said signals received from said relay means; and

means coupled to said ranging means and to said, code generator means for processing said transit time signals from said ranging means to determine relative positions of said vehicle with respect to said predetermined location and for providing said trigger pulses for altering said coded enabling signals upon reception of a transit time representative signal.

4,510,497

RAMARK BEACON APPARATUS

Kazuo Onozawa, Tokyo, Japan, assignor to OKI Electric Industry Co. Ltd., Japan

Filed Jul. 13, 1982, Ser. No. 397,691
Claims priority, application Japan, Jul. 20, 1981, 56-112312
Int. Cl.³ G01S *7/22, 13/80*
U.S. Cl. 343—5 EM **5 Claims**

1. A remark beacon apparatus for providing a marker line on a radar screen comprising:

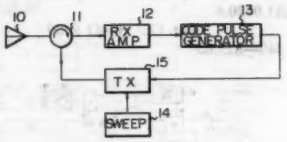
a transmitter,

a code pulse generator for providing a predetermined code to said transmitter to amplitude-modulate the same, and

an antenna coupled with said transmitter, characterized in that

a receiver coupled with said antenna is provided, and

said code pulse generator is operative to be initiated every



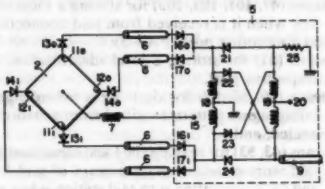
time said receiver provides a received radar pulse to said code pulse generator so that the code pulse is synchronized with the radar pulse, said code pulse having almost the same pulse repetition period as that of the radar pulse, said code pulse generator further being operative such that said code pulse continues until the next radar pulse is received, and said code pulse transmits a basic code repetitively.

4,510,498

PLATE ANTENNA FOR DIRECTION FINDER

Kenzo Mori; Hyo Yasuda, both of Tokyo, and Minoru Suzuki, Yamato, all of Japan, assignors to Taiyo Musen Co. Ltd., Tokyo, Japan

Filed Mar. 14, 1983, Ser. No. 475,358
Claims priority, application Japan, Dec. 14, 1982, 57-217886
Int. Cl.³ G01S *5/04*
U.S. Cl. 343—435 **3 Claims**

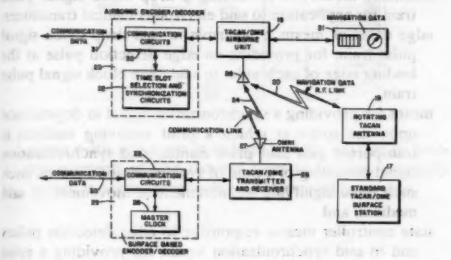


1. An antenna device for a direction finder comprising an electrically conductive base plate connected to a ground, an electrically conductive plate of a configuration symmetrical with respect to a central point thereof, which is disposed in parallel with the base plate with a predetermined space maintained between said base plate and said conductive plate, a plurality of pairs of connecting portions provided around the periphery of said electrically conductive plate so that one portion in each pair of the connecting portions is provided at a position opposite to the other portion in the pair with respect to the central point of said electrically conductive plate, and an electronic switch sequentially transferring the connection with the connecting portions such that one in each pair of the connecting portions thus transferred is grounded through a resistor having a resistance substantially equal to a characteristic impedance of said electrically conductive plate while the other in the pair is connected to a receiver through a cable having an impedance substantially equal to the characteristic impedance.

4,510,499
TACAN DATA LINK SYSTEM

John P. Chisholm, Olympic Valley, Calif., and Donald G. Morgan, Reston, Va., assignors to Vega Precision Laboratories, Inc., Vienna, Va.

Filed May 7, 1981, Ser. No. 261,619
Int. Cl.³ H04B 7/00
U.S. Cl. 343—456 52 Claims



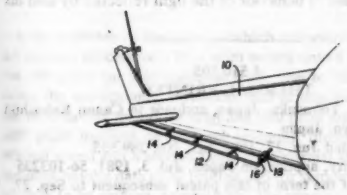
1. In a navigation system having a plurality of remote stations each having a navigational unit for transmitting to and receiving replies from a corresponding master navigational station to obtain navigational information on a corresponding navigational channel, a communication system having a master communication station for transmitting communication information to and receiving communication information from said remote stations on a common communication channel different than each of said corresponding navigational channels, said communication system comprising:

tuning means at each of said remote stations for momentarily tuning its navigation unit from its corresponding navigational channel to said common communication channel during a synchronized assigned discrete time interval and then back to its navigational channel whereby only a single remote station communicates during its assigned time interval.

4,510,500
AIRCRAFT SHORTED LOOP ANTENNA WITH IMPEDANCE MATCHING AND AMPLIFICATION AT FEED POINT

John F. Brune, Tinton Falls, N.J., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 28, 1983, Ser. No. 461,766
Int. Cl.³ H01Q 1/28
U.S. Cl. 343—708 15 Claims



1. An active antenna system coupled to remotely located radio apparatus comprising:

an electrically short antenna element having an inductive electrical characteristic mounted on a ground plane and including a feedpoint;

capacitance means, variable in accordance with the application of an electrical voltage signal thereto, coupled to said feedpoint for electronically tuning the antenna element to resonance at a selected operating frequency, said voltage variable capacitance means comprising sets of voltage variable capacitors selectively connected together in parallel with said antenna element to provide different values of composite capacitance for tuning the antenna element and being physically located in close proximity to said feedpoint;

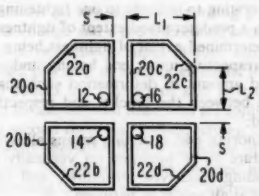
means for controlling the amplitude of the electrical voltage signal applied to said capacitance means, said voltage controlling means being remotely located from said feedpoint; and

RF amplifier means coupled between said feedpoint and said radio apparatus for amplifying high frequency electrical signals derived from said antenna element, said RF amplifier means being physically located in close proximity to said feedpoint.

4,510,501
BROADBAND LOOP ANTENNA WITH LOW WIND RESISTANCE

Oakley M. Woodward, Jr., Princeton, N.J., and Milton P. Greaves, Jr., Levittown, Pa., assignors to RCA Corporation, New York, N.Y.

Filed May 19, 1983, Ser. No. 496,311
Int. Cl.³ H01Q 11/14
U.S. Cl. 343—742 14 Claims

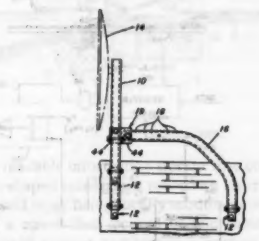


1. An antenna comprising a reflector, a feed means extending generally perpendicular from said reflector, and four truncated square loops coupled to said feed means, each of said loops having a truncated corner opposite said feed means.

4,510,502
DISH ANTENNAE MOUNTING STRUCTURE

Lyle W. Hovland, Murrysville, and James D. Klingensmith, Apollo, both of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Filed Mar. 7, 1983, Ser. No. 473,018
Int. Cl.³ H01Q 1/22
U.S. Cl. 343—880 9 Claims



1. A lightweight mounting structure combination for dish antennae comprising:

an upright vertically extending mast for supporting said dish antennae, said mast having an upper end for attachment to

said dish and a lower end for anchoring to a rigid-type structure;

a bent strut having a lower end for anchoring to a rigid-type structure and an upper end for attachment to said mast;

a second strut having a lower end for anchoring to a rigid-type structure and an upper end for attachment to said mast;

means for anchoring the respective ends of the mast, the bent strut and the second strut to the rigid-type structure, said means including for each respective lower end an anchor bracket, a threaded bolt having a shank portion for extending through said bracket and respective lower end, and a nut threaded on said bolt for drawing said anchor bracket and respective lower end tightly together, said bolt, nut, anchor bracket and respective lower end cooperating to indicate to one tightening the nut and bolt when a predetermined extent of tightness is attained, said predetermined extent of tightness being characterized by said respective lower end having undergone a predetermined extent of deformation such that relative movement between the bracket and respective lower end is minimized;

means for attaching the upper ends of the bent strut and the second strut to the mast's midsection, said means including a bracket, a threaded bolt having a shank portion for extending through the respective upper end and at least a portion of the bracket and a nut threaded on said bolt for drawing said bracket and respective upper end tightly together, said bolt, nut, bracket and respective upper end cooperating to indicate to one tightening the nut and bolt when a predetermined extent of tightness is attained, said predetermined extent of tightness being characterized by said respective upper end having undergone a predetermined amount of deformation such that relative movement between the bracket and respective strut is minimized;

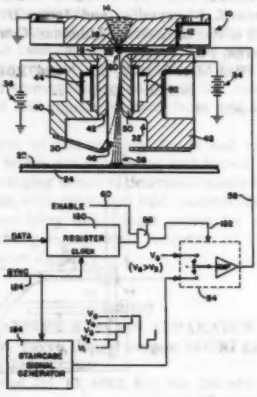
the anchoring and attaching means allowing the mounting structure to be mounted on vertically and horizontally extending rigid-type structures, and on structures disposed at all angles in between.

4,510,503

INK JET PRINTER CONTROL CIRCUIT AND METHOD

Suresh C. Paranjpe, Dallas, and Robert B. McJohnson, Pilot Point, both of Tex., assignors to The Mead Corporation, Dayton, Ohio

Filed Jun. 25, 1982, Ser. No. 392,195
Int. Cl.³ G01D *15/18*
U.S. Cl. 346—75 **19 Claims**



1. In an ink jet printer having an electromechanical transducer for mechanical stimulation of jet drop stream breakup and at least one charge electrode driver which, when enabled, provides drop charging signals to at least one charge electrode for selectively charging drops in a jet drop stream, said printer including a transport for moving a print receiving medium past a print station, a circuit for providing print enable signal pulses to said charge electrode driver and for providing a drop clock signal pulse train to said electromechanical transducer, comprising:

oscillator means for producing a drop clock signal pulse train for application to said electromechanical transducer,

edge detector means, responsive to said drop clock signal pulse train, for providing an edge detection pulse at the leading edge of each pulse in said drop clock signal pulse train,

means for providing a synchronization signal in dependence upon the speed at which a print receiving medium is transported past said print station, said synchronization signal consisting of a train of synchronization pulses, each such pulse signifying an increment of movement of said medium, and

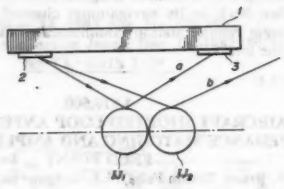
state controller means, responsive to edge detection pulses and to said synchronization signal, for providing a print enable pulse only upon receipt of the first edge detection pulse next following receipt of each synchronization pulse.

4,510,504

METHOD AND DEVICE FOR DETECTING DEFLECTION AMOUNT OF INK JET IN INK JET PRINTER

Masayoshi Tamai; Tetsuo Iyoda, and Yukihisa Koizumi, all of Ebina, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 3, 1983, Ser. No. 538,565
Claims priority, application Japan, Oct. 7, 1982, 57-176625
Int. Cl.³ G01D *15/18*; G01V *9/04*
U.S. Cl. 346—75 **8 Claims**



1. A method for detecting a deflection amount of ink jets in an ink jet printer comprising the steps of projecting light upon a flying ink drop, and detecting a deflection amount of said ink drop on the basis of behavior of the light reflected by said ink drop.

4,510,505

THERMAL PRINTER

Hiroshi Fukui, Yokosuka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 17, 1982, Ser. No. 389,555
Claims priority, application Japan, Jul. 3, 1981, 56-103235
The portion of the term of this patent subsequent to Sep. 27, 2000, has been disclaimed.
Int. Cl.³ G01D *15/10*
U.S. Cl. 346—76 PH **12 Claims**

1. A thermal printer, comprising:

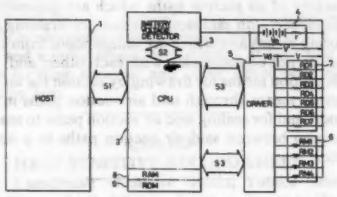
a thermal head having a plurality of heating elements;

a power supply for supplying power to said thermal head;

power supply voltage detecting means for detecting a voltage of said power supply a predetermined number of times; and

control means for determining an average voltage of the voltages detected by said power supply voltage detecting

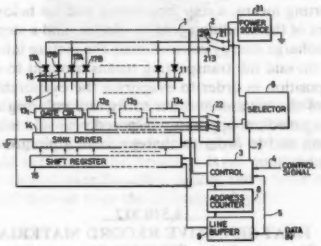
means the predetermined number of times, and for controlling the heating value of said thermal head in accordance with said average voltage and the number of heating elements of said thermal head to be simultaneously heated in accordance with predetermined print data.



4,510,506
RECORDING APPARATUS

Haruhiko Moriguchi; Fujio Moriguchi, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Nov. 8, 1982, Ser. No. 440,055
Claims priority, application Japan, Nov. 6, 1981, 56-177131
Int. Cl.³ G01D *15/10, 15/24*
U.S. Cl. 346—76 PH 12 Claims



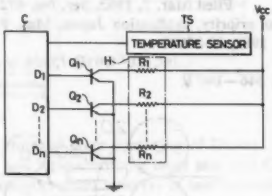
1. In a printer of the type in which successive lines of data are printed successively by a print means onto a print medium, the direction on said medium from line to successive lines being the sub-scanning direction, said printer further being of the type having means for scanning said print means relative to said print medium in said sub-scanning direction at a first normal speed and a second faster than normal speed for printing lines having data to be printed and for skipping lines having no data to be printed, respectively, the improvement comprising,

first means responsive to a plurality of successive lines of data for detecting for each said line of data the presence or absence of data to be printed, second means responsive to said first means for causing said scanning means to scan in said sub-scanning direction at said second speed for each line having an absence of data which is followed by a predetermined number of successive lines having an absence of data, and to scan at said first speed for all other lines of data.

4,510,507
THERMAL RECORDING APPARATUS

Yuji Ishikawa, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 516,963
Claims priority, application Japan, Aug. 5, 1982, 57-135757; Aug. 10, 1982, 57-137918
Int. Cl.³ A05B *1/00*
U.S. Cl. 346—76 PH 5 Claims



1. A thermal recording apparatus, comprising:

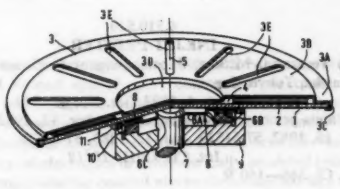
a thermal head including a plurality of heating elements arranged in a first direction for recording information on a thermal recording medium; and

control means for controlling said thermal head, wherein said control means (a) applies first recording pulses of a predetermined voltage and a predetermined width to said thermal head in response to input picture signals upon scanning of said plurality of heating elements in the first direction, (b) counts the number of said first recording pulses applied to said thermal head, and (c) applies to said thermal head second recording pulses, having one of the voltage and width thereof different from that of said first recording pulses, in response to the counted number of said first recording pulses when said thermal head is scanned in a second direction different from the first direction and is further scanned in the first direction.

4,510,508
OPTICAL DISC PRESSURE-COLLAPSIBLE COVER

Peter J. M. Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 15, 1983, Ser. No. 485,530
Claims priority, application Netherlands, Feb. 9, 1983, 8300478
Int. Cl.³ G01D *15/34;* G11B *7/24*
U.S. Cl. 346—135.1 5 Claims



1. An optically readable information storage disc comprising a transparent disc-shaped substrate, a recording layer disposed on the substrate, said layer being locally modifiable by a beam of radiation, and a cover disc secured to said substrate in a substantially gas-tight manner and having a portion which is spaced from at least that part of said recording layer on which information is to be recorded so as to form a sealed space therebetween, said cover disc being sufficiently flexible so that its resistance to deformations due to differences between gas pressure in said sealed space and ambient barometric pressure

is substantially lower than that of said substrate so as to reduce deformations of said substrate due to said pressure differences.

4,510,509

INK EJECTION HEAD

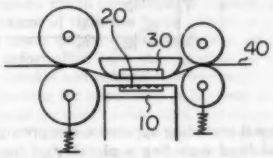
Masanori Horike, Tokyo; Tatsuya Furukawa; Takuro Sekiya, both of Yokohama; Yutaka Ebi, Kawasaki; Takuro Isayama, and Masaaki Tachiki, both of Tokyo, all of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Mar. 7, 1983, Ser. No. 472,530

Claims priority, application Japan, Mar. 9, 1982, 57-37007; Mar. 9, 1982, 57-37008

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R 5 Claims



1. An ink ejection head for an ink jet printer which prints out data on a sheet of paper by ejecting droplets of ink under the effect of an electric field, comprising:

a nozzle plate;

a plurality of nozzles formed through said nozzle plate to form a matrix in the widthwise direction and feed direction of the sheet;

a plurality of first electrodes each being integrally located on the inner periphery of one of the nozzles adjacent to an ink ejection port thereof, said first electrodes facing the sheet;

a plurality of lead terminals each being commonly connected to the first electrodes which are integral with the nozzles which form an array in the sheet feed direction;

a plurality of second electrodes each being commonly connected to the nozzles which form an array in the widthwise direction of the sheet, said second electrodes being located at the rear of the first electrodes; and

a counter electrode assembly positioned in front of the first electrodes and at the back of the sheet, said counter electrode assembly constituting a third electrode;

each nozzle ejecting droplets of ink in response to first, second and third predetermined voltages applied to the first electrode and second electrode associated with said nozzle and the third electrode respectively.

4,510,510

INKJET PRINTER

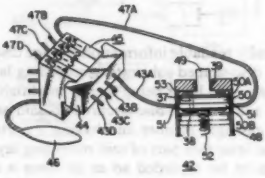
Koji Terasawa, Mitaka, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 4, 1983, Ser. No. 481,744

Claims priority, application Japan, Apr. 13, 1982, 57-61528; Apr. 13, 1982, 57-61529; Apr. 13, 1983, 57-61530

Int. Cl.³ G01D *15/18*

U.S. Cl. 346—140 R 9 Claims



1. An inkjet printer comprising:

a plurality of storing means storing inks of different colors;

a plurality of recording means for ejecting the inks stored in said storing means;

a plurality of air suction paths which are disposed in correspondence with said storing means for drawing air in said storing means and which are independent from each other and do not communicate with each other; and

single suction means for drawing by suction the air from said storing means through said air suction paths in a suction mode, and for sealing said air suction paths to seal communication between said air suction paths in a non-suction mode.

4,510,511

PICTURE RECORDING METHOD AND APPARATUS

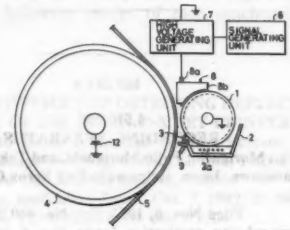
Makoto Akutsu, Saiwai-cho 7-10, Kuroiso-shi, Tochigi-ken, Japan

Filed Oct. 6, 1983, Ser. No. 539,609

Claims priority, application Japan, Oct. 6, 1982, 57-175752

Int. Cl.³ G01D *15/18*; B41L *13/08*

U.S. Cl. 346—140 R 8 Claims



1. A picture recording method comprising a step for supplying an ink containing an evaporable coloring matter to an ink transporting means, a step for cooling said ink below the melting point of the bonding agent of said ink, and a step for applying a discharge energy controlled by the picture information to the ink on said ink transporting means brought to a predetermined position in order to evaporate the evaporable coloring matter of the ink and in order to fly said coloring matter to a recording medium opposedly disposed near said ink transporting means and in order to thereby form a picture on said recording medium.

4,510,512

HEAT-SENSITIVE RECORD MATERIAL

Tosaku Okamoto, Osaka; Tomoyuki Okimoto, Amagasaki, and Katsuhiko Ishida, Takatsuki, all of Japan, assignors to Kanzaki Paper Manufacturing Company, Limited, Tokyo, Japan

Filed Dec. 9, 1982, Ser. No. 448,266

Claims priority, application Japan, Dec. 25, 1981, 56-214692; Feb. 22, 1982, 57-27818; Jul. 5, 1982, 57-118090

Int. Cl.³ B41M *5/18*

U.S. Cl. 346—209 19 Claims

1. A heat-sensitive record material for use with an infrared laser containing

(a) a color forming material,

(b) a color developing material, and

(c) a light absorbing material selected from the group consisting of (1) natural silicate compounds selected from the group consisting of the olivine group, garnet group, pyroxene group, amphibole group, serpentine group, plagioclase series of fledspar group, feldspathoid group, willemite, phenacite, zircon, cyanite and benitoite, (2) synthetic silicate compounds comprising, as the metal element, at least one of the bivalent or trivalent metal elements selected from the group consisting of magnesium, calcium, zinc, barium, aluminum, tin, lead, manganese, iron, nickel

and cobalt and baked at a temlperature of at least 500° C., and (3) baked products obtained by baking a zinc compound and a clay mineral at a temperature of at least 500° C., and

(d) the color forming material, color developing material and light absorbing material being dispersed in a binder resin and a color being formed when at least one of the color forming material and color developing material melts by heat.

4,510,513

HEAT SENSITIVE RECORD SHEET

Masahiko Yamaguchi; Michihiro Gonda; Yutaka Satoh, and Mikiko Kanasugi, all of Tokyo, Japan, assignors to Hodogaya Chemical Co., Ltd., Tokyo, Japan

Filed Jul. 13, 1983, Ser. No. 513,344
Claims priority, application Japan, Apr. 14, 1983, 58-64569
Int. Cl.³ B41M *5/18, 5/22*
U.S. Cl. 346—214 **4 Claims**

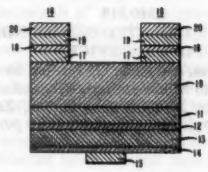
1. A heat sensitive record sheet which comprises a substrate having a coated layer comprising 2-anilino-3-methyl-6-dibutylaminofluoran.

4,510,514

OHMIC CONTACTS FOR SEMICONDUCTOR DEVICES

Irfan Camlibel, Stirling, and Aland K. Chin, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Aug. 8, 1983, Ser. No. 521,443
Int. Cl.³ H01L *23/54*
U.S. Cl. 357—17 **5 Claims**



1. An indium-containing semiconductor device, including an ohmic contact to a surface of the device comprising:

an alloy region comprising indium, gold and tin formed in the said surface of the device; a layer comprising chromium formed over the alloy region; and a layer comprising gold formed over the chromium layer.

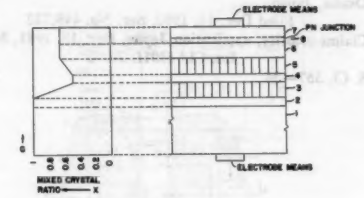
4,510,515

EPITAXIAL WAFER OF COMPOUND SEMICONDUCTOR DISPLAY DEVICE

Masaki Kajita, Hatano; Tomio Nakaya, Yokohama; Shinichi Hasegawa, and Hisanori Fujita, both of Tsuchiura, all of Japan, assignors to Stanley Electric Co., Ltd. and Mitsubishi Monsanto Chemical Co., Ltd., both of Tokyo, Japan

Continuation of Ser. No. 229,197, Jan. 28, 1981,. This application Feb. 10, 1984, Ser. No. 578,600
Int. Cl.³ H01L *29/161, 29/205, 33/00*
U.S. Cl. 357—17 **2 Claims**

1. In an epitaxial GaP wafer green light-emitting display device, comprising (a) a single crystalline semiconductor substrate consisting of GaP, (b) an active layer of N-doped GaP having a PN junction therein, (c) a GaP epitaxial layer formed on said single crystalline semiconductor substrate, and (d) electrode means coupled to said active layer for applying a voltage across said P-N junction, the improvement comprising a light-absorbing layer disposed between the GaP epitaxial layer and the active layer, said light-absorbing layer consisting of $GaAs_{1-x}P_x$ having a mixed crystal ratio (x) of 0.6 or less, a first graded epitaxial layer consisting of $GaAs_{1-x}P_x$ and formed between said light absorbing layer and said active layer, the mixed crystal ratio (x) of said $GaAs_{1-x}P_x$ first graded epitaxial layer continuously increasing in a growth direction extending from said substrate to said active layer, and



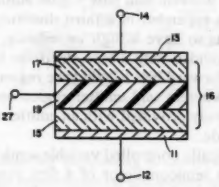
a second graded epitaxial layer consisting of $GaAs_{1-x}P_x$ and formed between said light-absorbing layer and said GaP epitaxial layer, the mixed crystal ratio (x) of said second graded $GaAs_{1-x}P_x$ epitaxial layer continuously decreasing in said growth direction.

4,510,516

THREE-ELECTRODE MOS ELECTRON DEVICE

Dirk J. Bartelink, 391 San Domingo Way, Los Altos, Calif. 94022

Filed Feb. 1, 1982, Ser. No. 343,954
Int. Cl.³ H01L *27/14*
U.S. Cl. 357—23.1 **21 Claims**



1. A three-terminal, two-port circuit element comprising,

first and second spaced-apart conductive electrodes disposed in a capacitive relationship, the electrodes terminating in respective first and second electrical terminals,

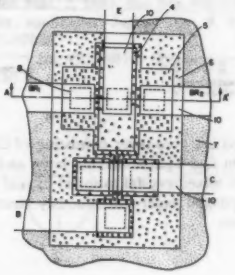
a semiconductor control electrode spaced between the first and second electrodes in a dielectrically insulated relation, the semiconductor control electrode connected to a third electrical terminal and having a thickness dimension such that two opposed depletion zones may be formed by electric fields in the semiconductor control electrode one proximate to each of the conductive electrodes, and

voltage supply means connected to the first, second and third terminals for forming and controlling said two opposed depletion zones in the semiconductor control electrode so that they proximately approach and recede from each other corresponding to charge depletion and accumulation, two of the three terminals combined into each of two circuits forming input and output ports permitting a.c. current flow in circuits connected to said terminals.

4,510,517
ELECTRONICALLY CONTROLLED VARIABLE SEMICONDUCTOR RESISTOR

Kenzo Tanabe, Katano, and Keiichiro Shimizu, Kyoto, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 14, 1982, Ser. No. 449,732
Claims priority, application Japan, Dec. 15, 1981, 56-202713
Int. Cl.³ H01L 29/72
U.S. Cl. 357—34 7 Claims



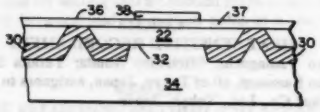
1. An electronically controlled variable semiconductor resistor comprising a semiconductor of a first conductivity type forming an emitter region having a high carrier density, a semiconductor of a second conductivity type which is opposite to said first conductivity type forming a base region adjoining said emitter region and having a lower carrier density than said emitter region, and a semiconductor of said first type of conductivity forming a collector region adjoining said base region, wherein said base region adjoining said emitter region is respectively expanded in a first direction on one side thereof and a second direction on another side thereof, said expanded base regions being respectively provided with two resistive electrodes for using said base region adjoining said emitter region as a resistor; and wherein said base region adjoining said emitter region is also expanded in a third direction at a different side thereof so as to have a high impedance, said expanded portion being provided with a base electrode for enabling the application of a forward bias to said base region and said emitter region; and wherein said emitter region and collector region are respectively provided with an emitter electrode and a collector electrode.

5. An electronically controlled variable semiconductor resistor comprising a semiconductor of a first conductivity type forming an emitter region of a high impurity carrier density, a semiconductor of a second conductivity type which is opposite to said first conductivity type forming a base region adjoining said emitter region and having a lower impurity carrier density than said emitter region, and a semiconductor of said second conductivity type forming a collector region adjoining said base region and having lower impurity carrier density than said emitter region, wherein a width of said base is made sufficiently small to allow minority carriers which are injected from said emitter region to said base region to reach said collector region almost without disapperaring; and wherein said collector region adjoining said base region is respectively expanded in a first direction on one side thereof and a second direction on another side thereof, said expanded collector regions being respectively provided with two resistive electrodes for using said collector region adjoining said base region as a resistor; and wherein said collector region adjoining said base region is also expanded in a third direction at a different side thereof, said expanded portion being provided with a collector electrode; and wherein said base region and emitter region are respectively provided with a base electrode and an emitter electrode.

4,510,518
DIELECTRIC ISOLATION FABRICATION FOR LASER TRIMMING

N. W. VanVonno, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 518,725, Jul. 29, 1983, Pat. No. 4,468,414.
This application May 9, 1984, Ser. No. 608,507
Int. Cl.³ H01L 27/12, 27/02, 10/00; B23K 9/00
U.S. Cl. 357—49 1 Claim

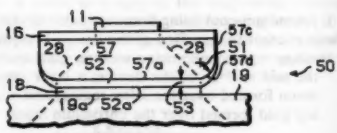


1. An integrated circuit with a thin film resistor comprising:
a plurality of single crystal islands dielectrically isolated from a polycrystalline support, one or more of which include an opening in the bottom of said dielectric isolation to optically expose a portion of said polycrystalline support from the top surface of said single crystalline island;
an isolation layer on said top surface of said single crystal island; and
a thin film resistor on said surface isolation layer juxtaposed with said opening in said bottom of said dielectric isolation.

4,510,519
ELECTRICALLY ISOLATED SEMICONDUCTOR POWER DEVICE

Jerry M. Dubois, Mesa, and Keith G. Spanjer, Scottsdale, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 26, 1982, Ser. No. 362,723
Int. Cl.³ H01L 23/02, 39/02, 23/30, 29/06
U.S. Cl. 357—81 13 Claims

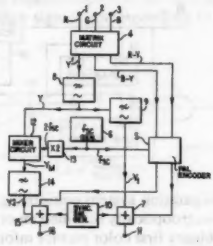


1. An electrical device suitable for removable mounting on an external heat sink, comprising:
a metallic heat spreader having a base portion of a first predetermined thickness and a base lead portion of a second predetermined thickness, said base portion having a first surface, a second surface opposed to said first surface, and a side coupled to a portion of said first and second surfaces, wherein said first surface has a device mounting portion and a lead mounting portion, and wherein said side and said second surface are joined by a substantially smooth curved surface having a predetermined minimum radius of curvature;
at least one additional lead, coupled to but electrically isolated from said lead mounting portion of said first surface of said base portion of said heat spreader;
dielectric means, intimately bonded to said second surface and said substantially smooth curved surface, exposed on said second surface, and having a third predetermined uniform thickness on said second surface less than said predetermined minimum radius of curvature.

4,510,520
TELEVISION TRANSMISSION SYSTEM

David W. Parker, Redhill, England, and Leendert J. van de Polder, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 7, 1983, Ser. No. 456,236
Claims priority, application United Kingdom, Jan. 25, 1982, 8201998
Int. Cl.³ H04N 9/36
U.S. Cl. 358—12 9 Claims



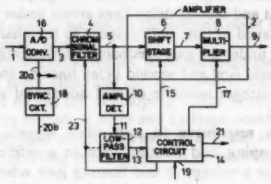
1. A high definition color television transmission system comprising means for dividing wide band luminance information into a first luminance portion containing lower frequency components of said luminance information and a second luminance portion containing higher frequency components of said luminance information, means for transmitting said first luminance portion by way of a first transmission path, means for frequency shifting said second luminance portion such that the resulting frequency-shifted second luminance portion lies within the bandwidth of a second transmission path which bandwidth is substantially equal to that of the first transmission path, and means for transmitting the frequency-shifted second luminance portion by way of the second transmission path, characterized in that said first luminance portion has a bandwidth which is narrower than that of said second luminance portion, while a color subcarrier modulated by color information is also transmitted by way of said first transmission path, the color subcarrier being located outside the bandwidth of said first luminance portion but within the bandwidth of said first transmission path, the system being such that the transmissions from the first and second transmission paths may be received together and the first and second luminance portions of the luminance information recombined for reproduction as a high definition color television display or the transmission from the first transmission path may be received alone for reproduction as a color television display of acceptable quality.

4,510,521
CIRCUIT FOR ADJUSTING THE AMPLITUDE OF A COLOR SIGNAL

Jürgen Ruprecht, Norderstedt, and Wolfgang Weltersbach, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 10, 1982, Ser. No. 416,726
Claims priority, application Fed. Rep. of Germany, Sep. 12, 1981, 3136216
Int. Cl.³ H04N 9/44
U.S. Cl. 358—27 19 Claims

1. A circuit for adjusting a fixed amplitude ratio between a chrominance signal, separated from a composite television signal, and a luminance signal by means of a variable-gain amplifier, the gain of which being controlled in dependence on the amplitude of a color synchronizing signal, characterized in that said circuit comprises, in addition to said variable-gain amplifier to which said chrominance signal, in the form of binary digitized samples, is applied and which comprises a shift stage for shifting a sample over a controllable integral number of bit positions, and an adjustable multiplier coupled to an output of said shift stage, an amplitude detector for measuring the amplitude of the color synchronizing signal contained in the chrominance signal applied to said variable-gain amplifier, and a control circuit, coupled to an output of said amplitude detector, having means for forming a shift control signal for

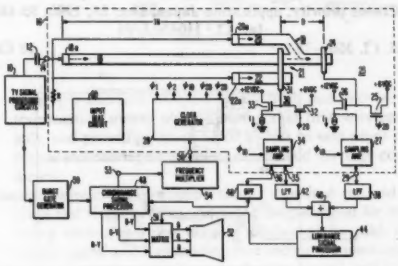


said shift stage from the quotient of a predetermined value and a measured amplitude value for said color synchronizing signal, and means for generating a multiplying factor for said adjustable multiplier.

4,510,522
CCD COMB FILTER EMPLOYING FLOATING GATE SUBTRACTOR TECHNIQUES

Dalton H. Pritchard, Princeton, and Donald J. Sauer, Plainsboro, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 28, 1982, Ser. No. 383,301
Int. Cl.³ H04N 9/535
U.S. Cl. 358—31 12 Claims



1. A comb filter for processing a composite video signal containing image representative luminance and chrominance components in a horizontal scanning interval, said luminance and chrominance components disposed within a frequency spectrum in an interleaved relation, said chrominance components alternating in phase between consecutive horizontal intervals, comprising:

a substrate;

a first delay line including a first channel formed in said substrate;

a second delay line including a second channel formed in said substrate;

a floating gate overlying both of said first and second channels;

said first delay line also including a first number of gates overlying said first channel between a first gate thereof and said floating gate;

said second delay line also including a second number, different from said first number, of gates overlying said second channel between a first gate thereof and said floating gate;

first and second input means each responsive to said composite video signal for coupling charge packets representing

samples of said composite video signal to said first and second channels, respectively;

means for applying clock signals to said gates of said first and second delay lines for transferring said charge packets under said gates so that the charge packets of one of said first and second delay lines arrive under said floating gate delayed in time with respect to the charge packets arriving under the gate preceding said floating gate of the other of said first and second delay lines by an amount equal to an integer multiple of said horizontal scanning interval; and

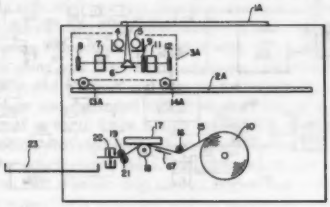
means responsive to said clock signals for periodically clamping said floating gate to a reference potential to sense a voltage at said floating gate when not clamped to said reference potential which is representative of a subtractive combination of said charge packets under said floating gate and said charge packets under said gate preceding said floating gate and thereby representative of said chrominance components of said composite video signal.

4,510,523

TWO-COLOR COPYING MACHINE

Masami Kurata; Toshiharu Inui, and Takashi Ohmori, all of Kanagawa, Japan, assignors to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1981, Ser. No. 334,199
Claims priority, application Japan, Dec. 26, 1980, 55-183840
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—75 **18 Claims**



1. A two-color copying machine, comprising:

a platen on which an original document is placed, said original document having an image thereon;

recording signal generation means, including a scanner unit, for reading image data from said original and producing recording signals representing different colors of said image, said scanner unit and platen being mounted for relative movement with respect to one another;

a thermal recording medium which records in a first color when heated to a first temperature range and records in a second color when heated to a second temperature range;

thermal head means responsive to said recording signals for selectively heating portions of said recording medium to temperatures within at least one of said first and second ranges; and

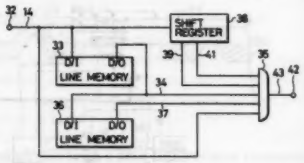
said scanner unit providing output signals representing said image with a resolution of X picture elements per millimeter and said thermal head selectively heating said recording medium at Y locations for every X picture elements, said recording signal generating means including means for varying the value of Y to thereby vary a magnification ratio of said copying machine.

4,510,524

COLOR PICTURE READING SYSTEM

Masami Kurata, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Jul. 23, 1982, Ser. No. 401,432
Claims priority, application Japan, Jul. 24, 1981, 56-115322
Int. Cl.³ H04N *1/46*
U.S. Cl. 358—80 **8 Claims**



1. A color separation system comprising:

means for electrooptically scanning an original to develop at least one binary first color picture information signal, each bit in said signal corresponding to a picture element of said original and having a first and second value representing first color and not first color, respectively, said signal comprising a successive line of bits representing scanned lines of said picture elements, and

color correction means responsive to said binary first color picture information signal for generating a corrected first color picture information signal wherein certain noise bits of said first value in said uncorrected signal are changed to bits of said second value in said corrected signal, said color correction means comprising:

present bit detecting means for detecting the bit value of the present bit, representing a given picture element, occurring in said uncorrected signal,

previous bit detecting means for detecting the bit values of selected previous bits, representing neighboring picture elements with respect to said given picture element, occurring in said uncorrected signal,

means responsive to said latter two detecting means for correcting said present bit from a first value representing first color to a second value representing the absence of said first color unless said present bit in said uncorrected signal is said first value and selected ones of said previous bits have said first value,

said previous bit detecting means comprises means for detecting the n preceding successive bits in the same scanning line as said present bit and for detecting one bit in each of the preceding m lines, each of said bits in said m lines being in positions in their respective lines corresponding to the positions of said present bit in its line, and wherein said numbers m and n need not be equal.

4,510,525

STEREOSCOPIC VIDEO IMAGERY GENERATION

Gilbert G. Kuperman, and Fred R. Bodine, both of Dayton, Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 23, 1982, Ser. No. 361,016
Int. Cl.³ H04N *3/02*
U.S. Cl. 358—88 **3 Claims**

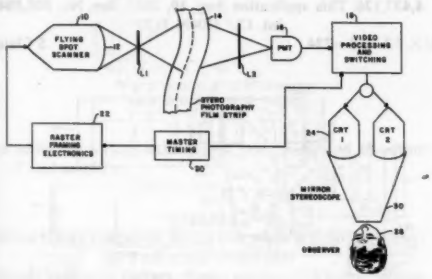
1. A system for generation of stereoscopic video imagery from photographic film which has stereoscopic pairs on first and second separate parallel strips along its length, said system comprising:

flying spot scanner means for producing first and second unmodulated rasters which respectively alternately transilluminate said first and second strips in its film plane to modulate the light; in which the flying spot scanner means includes raster forming means and a single scanner face, wherein the raster forming means generates raster lines at

a double rate, and alternate lines have a lateral offset corresponding to the physical separation between stereo photographic pairs on said first and second strips, to thereby provide said first and second rasters on the single scanner face, with each raster having a given line and frame rate with both horizontal sweep and vertical sweep according to a conventional standard;

light detecting means comprising a single photomultiplier tube for detecting the modulated light;

video processing means coupled to the light detecting means to produce video signals corresponding to the modulated light;



switching means for separating the video signals into first signals which result from illumination of said first strip by the first raster and second signals which result from illumination of said second strip by the second raster, so that said video processing means and said switching means generates two channels of video at said given video field and frame rates, and for supplying the first and second signals to provide imagery respectively on the first display area and the second display area;

means for moving said film through the film plane of the flying spot scanner means so that successive images are illuminated in successive frames; and

stereoscopic means for viewing said first and second display areas.

4,510,526

SURVEILLANCE SYSTEM

John M. Coutta, 22054 La Brisas Cir., Boca Raton, Fla. 33433, and Paul A. Van Dusen, Lithonia, Ga. 30058

Filed Apr. 19, 1983, Ser. No. 486,511
Int. Cl.³ H04N 7/18
U.S. Cl. 358—108 **3 Claims**

1. A surveillance system comprising:

an elongated track positioned along a path;

a carriage adapted to be supported on and be movable along said track;

electromotive means coupled to said carriage for selectively moving said carriage along said track;

a television camera having a video output signal;

mounting means for pivotally supporting said camera on said carriage about an axis lying along and central to said track, and wherein the direction of view of said camera generally lies along said axis;

pivot drive means interconnected to said mounting means and responsive to a pivot drive signal for rotating said mounting means and thereby said camera about said axis;

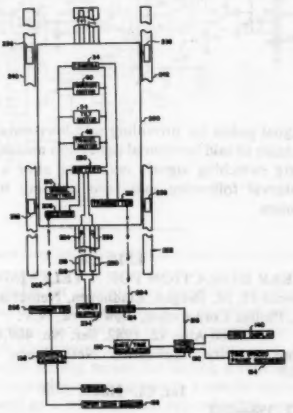
a mirror supported by said mounting means and angularly positionable within a selected range between a position wherein at lest one of its reflective surfaces is normal to the axis of view of said camera and a position wherein a reflective surface is parallel with said axis, and said mirror being positionable to intercept the view of said camera and enabling viewing of a region generally to one side of said axis;

carriage control means coupled to said electromotive means and responsive to a carriage control signal for selectively positioning said carriage, and thereby said camera, along said track;

fixed mounted control means for developing pivot input and carriage control signals;

first wireless transmission means, fixed mounted and responsive to said pivot input and carriage control signals from said control means for developing a first wireless signal modulated by said pivot input and carriage control signals and directing said wireless signal toward said carriage;

first wireless receiving means mounted on said carriage for



receiving said first wireless signals from said first wireless transmission means, demodulating said first wireless signals, and providing pivot input signals to said pivot drive means and carriage control signals to said carriage control means;

second wireless transmission means mounted on said carriage and responsive to said video output signal for developing second wireless signals modulated by said video output signal and transmitting said second wireless signals;

second wireless receiving means, fixed mounted, and including means for receiving said second wireless signals from said second wireless transmission means and providing as an output a video signal;

display means responsive to said video signal for displaying said video output.

4,510,527

HORIZONTAL DEFLECTION PHASING ARRANGEMENT

Willem den Hollander, Schlieren, Switzerland, assignor to RCA Corporation, Princeton, N.J.

Filed Mar. 28, 1983, Ser. No. 479,446
Int. Cl.³ H04N 5/04; H01J 29/56
U.S. Cl. 358—158 **6 Claims**

6. A frequency and phase control circuit for a television receiver incorporating horizontal deflection means providing a horizontal deflection signal having positive and negative amplitude portions in response to horizontal rate switching signals, comprising:

a source of horizontal rate synchronizing pulses;

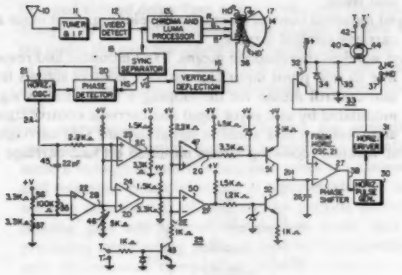
a horizontal rate oscillator providing an output signal;

frequency control means responsive to said horizontal rate synchronizing pulses for adjusting the frequency of said horizontal rate oscillator;

means responsive to the occurrence of the zero amplitude

crossing of said horizontal deflection signal for producing zero crossing indicative signal pulses;

synchronizing control means coupled to said horizontal rate oscillator and responsive to said zero crossing indicative



signal pulses for providing said horizontal rate switching signals to said horizontal deflection means, said horizontal rate switching signals occurring after a predetermined interval following said zero crossing indicative signal pulses.

4,510,528

SMEAR REDUCTION FOR A TELEVISION PICKUP

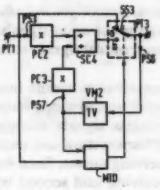
Franciscus H. M. Bergen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 12, 1982, Ser. No. 407,674

Claims priority, application Netherlands, Sep. 4, 1981, 8104103

Int. Cl.³ H04N *5/34*

U.S. Cl. 358—213 **7 Claims**



1. A correction arrangement for reducing smear in a raw television picture signal to produce as an output a corrected television picture signal, said arrangement comprising:

delay means having an input and an output, the input for receiving the corrected television picture signal, the output supplying an output signal which is equal to the corrected television picture signal after a delay of one field period;

comparator means for measuring the difference between the raw television picture signal and the delayed corrected television picture signal, said comparator means producing a first output signal if the measured difference exceeds a preselected threshold value and producing a second output signal if the measured difference is less than the preselected threshold value; and

signal averaging means for producing a corrected output signal in response to the output of the comparator means, said corrected output signal being equal to the raw television picture signal if the output of the comparator means is the first output signal, said corrected output signal being equal to a weighted average of the raw television picture signal and the delayed corrected television picture signal if the output of the comparator means is the second output signal, said corrected output signal being the corrected television picture signal.

4,510,529

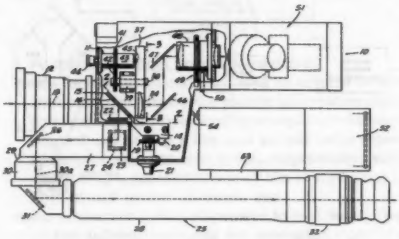
ELECTRONIC CINEMA CAMERA

Robert E. Gottschalk, Los Angeles, Calif., assignor to Panavision, Incorporated, Tarzana, Calif.

Continuation of Ser. No. 285,157, Jul. 20, 1981, Pat. No. 4,437,126. This application Aug. 19, 1983, Ser. No. 505,594

Int. Cl.³ H04N *5/30*

U.S. Cl. 358—224 **5 Claims**



1. A camera device for electronic cinematography comprising, in combination: a housing, an objective lens assembly removably mounted on said housing and having an optical axis, a fixed mirror in said housing, a movable turret having a plurality of lenses each movable into alignment with said optical axis to transmit light to said fixed mirror, a television camera, an optical viewfinder assembly, a movable iris device optically interposed between said fixed mirror and said television camera, a television monitor connected to receive electrical impulses derived from said television camera, and multi-mode means for transmitting all light from said objective lens assembly to said optical viewfinder assembly in a first mode, and transmitting all light from said objective lens assembly to said television camera in a second mode.

4,510,530

SIGNAL REPRODUCING CIRCUIT FOR A VIDEO TAPE RECORDER

Kuniaki Miura, Yokosuka; Akira Shibata, Katsuta; Jun Yamada, Yokohama, and Katashi Hazama, Zushi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 18, 1982, Ser. No. 389,968

Claims priority, application Japan, Jun. 26, 1981, 56-98222; Jan. 11, 1982, 57-1827

Int. Cl.³ H04N *9/48*

U.S. Cl. 358—314 **10 Claims**

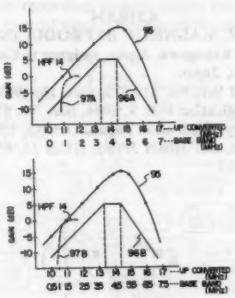
3. A signal reproducing circuit in a video tape recorder comprising in an FM luminance signal circuit,

an up-converter for up-converting a reproduced signal;

a surface acoustic wave filter connected to an output of said up-converter, and said surface acoustic wave filter having a parallel circuit of a first filter for mainly peaking a high frequency component and a second filter for mainly peaking a low frequency component;

a limiter connected to an output of said first filter of said surface acoustic wave filter;

an amplifier connected to an output of said second filter of said acoustic surface wave filter; and



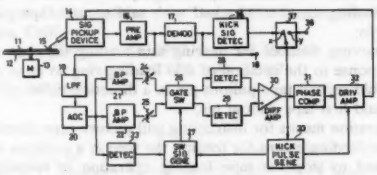
an adder for adding an output of said limiter and an output of said amplifier.

4,510,531

ROTARY RECORDING MEDIUM AND REPRODUCING APPARATUS THEREOF

Hiroyuki Sugiyama, Isehara, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Filed Jul. 14, 1982, Ser. No. 398,230
Claims priority, application Japan, Jul. 15, 1981, 56-110586
Int. Cl.³ H04N *5/76*
U.S. Cl. 358—342 **6 Claims**



1. A rotary recording medium to be played on a reproducing apparatus having a reproducing element for reproducing recorded signals from the rotary recording medium,

said rotary recording medium having a spiral track made up of a plurality of track turns on which a video signal, a kick instruction signal, and an audio signal are recorded,

said video signal being recorded on the track turns in terms of units, and the video signal of an identical unit being repeatedly recorded in one track turn whereby a still picture reproduction is performed from the track turn when the reproducing element repeatedly scans over the same track turn, and whereby a normal reproduction is performed from the track turns which are scanned by the reproducing element along a predetermined scanning locus,

said kick instruction signal being modulated and causing the reproducing element to shift from one track turn to another track turn, and said kick instruction signal being recorded during vertical blanking intervals of the video signal with an interval which is equal to a predetermined number of units of the video signal and is in accordance with the kind of video signal program source from which the video signal is supplied,

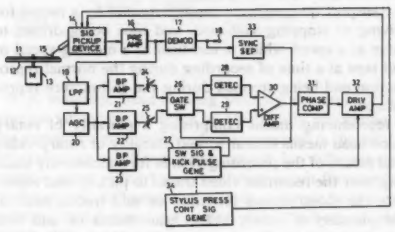
said audio signal being made up of divided audio signal parts each having a duration of one unit of the video signal, said divided audio signal parts being distributively recorded on the track turns so that a continuous audio signal is reproduced by the reproducing element as the reproducing element scans over the track turns along said predetermined scanning locus during the normal reproduction.

4,510,532

ROTARY RECORDING MEDIUM REPRODUCING APPARATUS

Atsumi Hirata, Fujisawa, Japan, assignor to Victor Company of Japan, Ltd., Japan

Filed Apr. 5, 1983, Ser. No. 482,064
Claims priority, application Japan, Apr. 6, 1982, 57-56970
Int. Cl.³ G11B *3/30*
U.S. Cl. 358—342 **6 Claims**



1. A rotary recording medium reproducing apparatus comprising:

a reproducing stylus for reproducing recorded signals from a rotary recording medium which is recorded with an information signal on a spiral track, by tracing over said spiral track on the rotary recording medium;

reproducing mode setting means for setting a reproducing mode of said reproducing apparatus to a special reproduction mode such as a quick-motion reproduction mode in which said reproducing stylus successively shifts to and traces over adjacent track turns of said spiral track, and a still picture reproduction mode in which said reproducing stylus repeatedly traces over the same track turn of said spiral track, besides a normal reproduction mode in which said reproducing stylus successively and continuously traces over the said spiral track;

stylus pressure control signal generating means for generating a stylus pressure control signal of a voltage having a magnitude in accordance with the set reproducing mode, according to the reproducing mode set by said reproducing mode setting means; and

stylus pressure applying means applied with the stylus pressure control signal generated by said stylus pressure control signal generating means, for applying a stylus pressure to said reproducing stylus.

4,510,533

SYSTEM FOR REPRODUCING A VIDEO SIGNAL IN A SLOW MOTION OR STILL PICTURE REPRODUCTION

Yoshio Tokuyama, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Yokohama, Japan

Continuation of Ser. No. 267,083, May 26, 1981, abandoned.
This application Aug. 3, 1983, Ser. No. 519,881
Claims priority, application Japan, May 26, 1980, 55-69870
Int. Cl.³ G11B *21/10*
U.S. Cl. 360—10.2 **11 Claims**

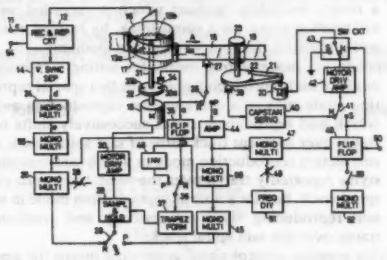
1. A reproducing system for carrying out both a normal reproduction and a still-picture reproduction, said reproducing system comprising:

an elongated tape on which video signals are recorded in a frame format on video tracks extending obliquely with respect to the longitudinal direction of the tape, and on which a control signal is recorded along a control track extending in the longitudinal direction along the tape, said control track and said video tracks having a fixed spatial

relationship with respect to each other along the length of said tape, said video tracks being recorded by a plurality of rotary video head means of a recording system, each of said video head means of the recording system having a gap with a mutually different azimuth angle, control head means in said recording system for recording said control signal along the control track, said control head means of said recording system being positioned at a first and pre-established location which is displaced from a certain location where said video heads of the recording system terminates scanning over a video track on the tape which is running away from the certain location, and said control head recording the control signal without subjecting the control signal to a time delay;

tape transport comprising a capstan rotated by a motor for driving or stopping said tape, said tape being driven to move at a speed which is identical to a moving speed of said tape at a time of recording during the normal reproduction and being stopped during the still-picture reproduction;

first reproducing means comprising a plurality of rotary video head means similar to said plurality of rotary video head means of the recording system for successively scanning over the recorded video tracks to pick up and reproduce the video signals recorded on said tracks, each of said plurality of rotary video head means of said first reproducing means having a gap with said mutually different azimuth angles similar to the gaps of said video head means of the recording system;



second reproducing means including control head means for reproducing the recorded control signal from the control track while the driven tape is moving, said control head means of said second reproducing means being positioned at a location which is displaced by a predetermined distance upstream on the tape with respect to said pre-established location of said control head means of the recording system;

variable delay means enabled only at the time of still-motion reproduction for delaying the reproduced control signal by a first delay time, said first delay time being variable within a specific range so that a reproduced video signal output becomes a minimum value within a vertical blanking period in the video when said rotary video head means of said first reproducing means are actively scanning over said tape at a position where the tape finally stops after having moved due to inertia of said tape transport means, said inertia occurring while the tape is being stopped after said first delay time responsive to said reproduced control signal in order to carry out a still-picture reproduction; and

fixed delay means only at the time of normal reproduction for delaying the reproduced control signal by a second delay time during the normal reproduction, said second delay time corresponding to the time required for said tape to move said predetermined distance

to compensate for a time advancement of the reproduced control signal caused by the control head means of said second reproducing means displaced upstream of the tape by said predetermined distance.

4,510,534

STILL-MODE MAGNETIC REPRODUCING DEVICE

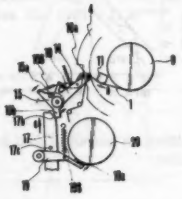
Masaya Maeda, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 310,873, Oct. 13, 1981, abandoned. This application Feb. 9, 1984, Ser. No. 578,342

Claims priority, application Japan, Oct. 13, 1980, 55-143242

Int. Cl.³ H04N *5/783;* **G11B** *15/43*

U.S. Cl. 360—10.3 **31 Claims**



1. A reproduction device for reproducing picture information on a tape in a cassette, comprising:

a tape guide body having a reproducing rotary head and guiding said tape;

tape loading means for pulling said tape out of said cassette and for winding said tape around said guide body, including first and second tape pullout pins for pulling said tape out of said cassette when in contact with said tape;

a loading ring rotatable around the tape guide body for moving said first tape pullout pin;

a loading member attached with said second tape pullout pin;

a moving member for moving said loading member in response to the rotation of said loading ring so as to move said second tape pullout pin in a direction different from said first tape pullout pin;

operation means for instructing still picture reproduction;

tape feeding means for feeding the tape at a constant speed and to stop the tape feeding operation in response to operation of said operation means;

prohibition means for prohibiting the supplying of the tape out from the cassette and rewinding of the tape in response to operation of the operation means; and

tension means for increasing the spring force given to the second guide pin so as to impart tension to the tape between the guide body and the cassette in response to operation of the operation means.

4,510,535

VIDEO INSERT EDITING WITH CONTROL SIGNALS DERIVED OFF TAPE OR FROM THE INSERT

Junsuke Tokumitsu, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed Dec. 14, 1982, Ser. No. 449,828

Claims priority, application Japan, Dec. 22, 1981, 56-191414[U]

Int. Cl.³ H04N *5/782;* **G11B** *27/02*

U.S. Cl. 360—14.2 **5 Claims**

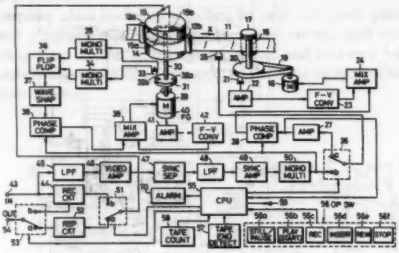
1. A magnetic recording and reproducing apparatus comprising:

editing means for editing and recording a new video signal within a predetermined section of a magnetic tape which has already recorded thereon a video signal on video tracks and a control signal on a control track, respectively;

control signal producing means for producing a new control signal having a frequency identical to that of the recorded control signal;

control signal recording and reproducing means for reproducing the recorded control signal from said magnetic tape while said editing means is operating; and

control signal recording control means for detecting existence of a control signal reproduced by said control signal



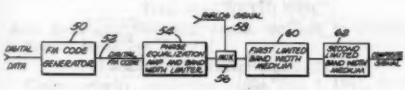
recording and reproducing means, and for supplying the new control signal produced by said control signal producing means to said control signal recording and reproducing means when non-existence of the reproduced control signal is detected, to record said new control signal on the control track of said magnetic tape.

4,510,536

SIGNAL CONDITIONING METHOD AND APPARATUS FOR FM CODE SIGNAL

George K. Tabata, Wilmington, and Raymond Yardy, Irvine, both of Calif., assignors to Discovision Associates, Costa Mesa, Calif.

Filed Jul. 16, 1982, Ser. No. 399,049
Int. Cl.³ G11B 5/45, 15/02
U.S. Cl. 360—65 **3 Claims**



1. A method of encoding a digital FM code signal and an analog signal as an FM signal of limited bandwidth without distortion caused by phase distortion introduced in an intermediate recording step and without separate processing of the digital signal between the recording and the encoding, comprising the steps of:

generating the desired FM code signal;

limiting the bandwidth of the FM code signal;

altering the phase equalization of the FM code signal;

recording the bandwidth-limited and phase-equalization-altered FM code signal as an AM signal on a recording track;

recording non-overlapping analog information on said recording track;

recovering the recorded FM code signal and the recorded analog signal, said step of altering the phase equalization being performed such that the phase distortion of said phase-equalization-altered signal occurring during said recording and recovering steps results in a signal having substantially no phase distortion relative to the generated FM code signal; and

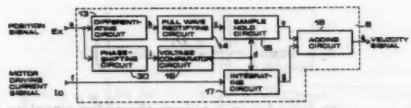
frequency modulating a carrier signal over a predetermined limited bandwidth to thereby encode the recovered FM code signal and the recovered analog signal as an FM signal.

4,510,537

MAGNETIC HEAD MOVING VELOCITY DETECTOR

Shigemasa Yoshida, and Ichiro Araki, both of Kanagawa, Japan, assignors to Computer Basic Technology Research Assoc., Japan

Filed May 3, 1983, Ser. No. 491,185
Claims priority, application Japan, May 4, 1982, 57-74721; Sep. 28, 1982, 57-168733
Int. Cl.³ G11B 5/55
U.S. Cl. 360—78 **16 Claims**



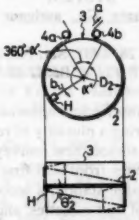
5. A magnetic head moving velocity detector of the type wherein velocity is detected by electrically processing a position signal of a magnetic head, characterized in that said detector comprises a differentiating circuit for differentiating the position signal, a full-wave rectifying circuit for rectifying an output of said differentiating circuit, a sample hold circuit for sampling and holding an output of said full-wave rectifying circuit, delaying means for delaying the position signal, and a timing pulse generating circuit for detecting the level of an output of said delaying means to determine the timing for sampling, the phase delaying characteristic of the transfer characteristic of said differentiating circuit being substantially coincided with the phase delaying characteristic of the transfer characteristic of said delaying circuit.

4,510,538

MAGNETIC RECORDING APPARATUS

Seiji Sato, Yokohama, and Koichi Takeuchi, Kamakura, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 14, 1982, Ser. No. 449,781
Claims priority, application Japan, Dec. 14, 1981, 56-201397
Int. Cl.³ G11B 5/52
U.S. Cl. 360—84 **12 Claims**



1. In helical scan type magnetic recording apparatus having a rotary magnetic head with at least one magnetic gap and disposed on a reduced-size guide drum of a diameter D_2 about which a magnetic tape is wound for a wrapping angle α for recording of fields of a video signal having a standard vertical synchronizing frequency f_V in slant tracks on the tape arranged at a recording angle θ_0 with respect to the longitudinal direction of the tape when the tape is advanced at a tape running speed V, with the length of the tracks being l'_N, such that the recorded tape is compatible with standard video playback apparatus having a standard-sized rotary drum of diameter D_1, greater than the diameter D_2, and with the tape being wrapped thereabout for a wrapping angle of substantially 180° and at a still angle of θ_1 with the video signal reproduced from said tape having said standard vertical synchronizing frequency f_V and a standard horizontal scanning frequency f_H; the improvement

wherein said diameter D_2 of the reduced-size guide drum is selected to satisfy the equation

$$D_2 = \frac{1}{\pi}\sqrt{\left(\frac{360^\circ}{\alpha}\cdot l_N\right)^2 + \left(\frac{V}{f_V}\right)^2 + 2\cdot\frac{360^\circ}{\alpha}\cdot\frac{l_N V}{f_V}\cos\theta_0}\ ;$$

the tape is wrapped about the reduced-size guide drum at a still angle of θ_2 selected to satisfy the equation

$$\theta_2 = \arcsin\left(\frac{180^\circ}{\alpha}\cdot\frac{D_1}{D_2}\cdot\sin\theta_1\right)\ ;$$

and means are provided to produce the video signal to be recorded by the apparatus having the reduced-size guide drum with a non-standard horizontal scanning frequency f'_H selected to satisfy the equation

$$f_H = \frac{360^\circ}{\alpha} f_H.$$

4,510,539

CONTINUOUS LOOP CASSETTE CHANGER APPARATUS FOR A DICTATION/TRANSCRIPTION SYSTEM

Jeffrey E. Young, Atlanta, Ga., assignor to Lanier Business Products, Inc., Ga.

Filed Dec. 28, 1981, Ser. No. 334,975

Int. Cl.³ G11B *15/68;* **B65G** *43/10, 37/00*

U.S. Cl. 360—92 **2 Claims**

1. In a dictation/transcription apparatus including a first storage location for storing a plurality of recording cassettes, a dictation record/listen station, first conveying means for conveying individual cassettes from said first storage location to said dictation record/listen station, a second storage location for storing a plurality of said cassettes, and second conveying means for conveying said individual cassettes from said dictation record/listen station to said second storage location, the improvement comprising:

a transcription listen station;

third conveying means for conveying individual cassettes from said second storage location to said transcription listen station;

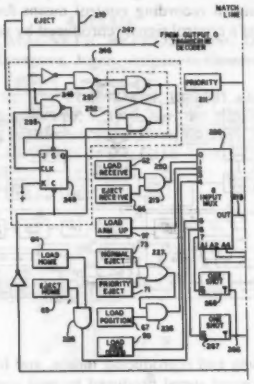
fourth conveying means for conveying said individual cassettes from said transcription listen station to said first storage location;

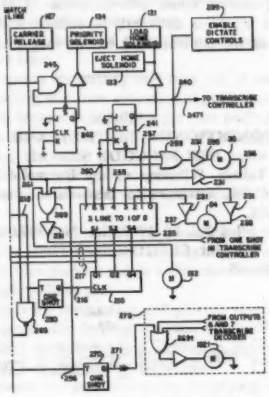
dictate eject means for initiating operation of said first conveying means and said second conveying means;

means for providing a first input signal during operation of said third conveying means or said fourth conveying means;

means for providing a second input signal during the absence of operation of said third conveying means and said fourth conveying means; and

means responsive to said first input signal for preventing initiation of operation of said first conveying means and





said second conveying means by said dictate eject means until said second input signal is provided.

4,510,540

CASSETTE EJECTION MECHANISM FOR A CASSETTE TAPE RECORDER

Toshikazu Kato, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jun. 30, 1982, Ser. No. 393,784

Claims priority, application Japan, Jul. 13, 1981, 56-103520[U]

Int. Cl.³ G11B *15/00*

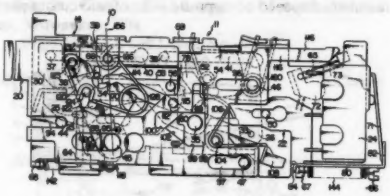
U.S. Cl. 360—93 **5 Claims**

1. A cassette ejection mechanism of a cassette tape recorder comprising a pair of guide plates facing each other, a cassette holder disposed between the guide plates to be movable between an up position and a down position and containing a tape cassette therein, and slide means disposed to be slidable substantially horizontally along the cassette holder and being slidable together with the tape cassette in the cassette holder, wherein the tape cassette inserted in the cassette holder, along with the cassette holder, is moved to its down position after the tape cassette slides in the cassette holder, and further comprising:

an ejecting plate attached to one of the guide plates to be movable between a first position and a second position,

whereby the cassette holder is pushed up from the down position to the up position thereof as the ejecting plate moves from the first position to the second position, and the tape cassette in the cassette holder slides to be ejected as the ejecting plate moves from the second position to the first position;

a coupling plate rockably attached to said one guide plate, said coupling plate engaging the slide means, said coupling plate having an engaging portion, and said coupling plate being rockable in response to the slide motion of the slide means;



a toggle spring having one end attached to said one guide plate and having another end attached to the coupling plate to apply an urging force to the coupling plate in rocking motion; and

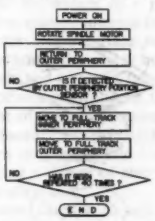
a swinging strip swingably attached to the ejecting plate, the swinging strip having a holding portion to engage the engaging portion of the coupling plate to cause the coupling plate to rock against the urging force of the toggle spring as the ejecting plate moves from the second position to the first position and to be disengaged from the engaging portion after the toggle spring passes its neutral point.

4,510,541

MAGNETIC DISK STORAGE UNIT WITH RECIPROCATING MAGNETIC HEAD FOR CLEANING THE MAGNETIC DISC

Asao Sasamoto, Odawara, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed May 24, 1982, Ser. No. 381,303
Claims priority, application Japan, Jun. 1, 1981, 56-82481
Int. Cl.³ G11B *5/41, 5/012*
U.S. Cl. 360—97 **11 Claims**



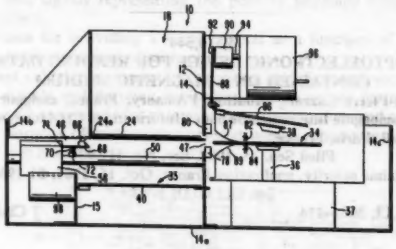
1. A magnetic disk storage unit including a magnetic head and a disk for recording and reproducing information, means for controlling said magnetic head to be in contact with a surface of said magnetic disk when said magnetic disk is stationary or rotated at a low speed and to float away from the surface of said magnetic disk as the revolution rate of said magnetic disk increases, and drive control means for enabling reciprocating movement of said magnetic head in a radial direction of said magnetic disk when said magnetic disk starts to rotate, whereby dust on at least one of said magnetic disk surface and said magnetic head is removed.

4,510,542

METHOD AND APPARATUS FOR HANDLING MAGNETIC RECORDING DISKS

Michael J. Aggeler, Byron, Calif., assignor to Texor Corporation, Mountain View, Calif.

Filed Dec. 22, 1982, Ser. No. 452,276
Int. Cl.³ G11B *17/10*
U.S. Cl. 360—98 **14 Claims**



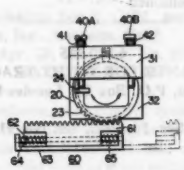
1. Disk handling apparatus comprising: a support; means on the support for forming a bin adapted to receive a stack of disks, said bin having a lower, open end and means permitting the lowermost disk to be moved laterally of the bin as the other disks of the stack remain in the bin; means adjacent to the bin forming means for moving the lowermost disk laterally of the bin to a first location at which the lowermost disk is exteriorly of the bin, whereby at least one task can be performed with the lowermost disk, said moving means having means for shifting the lowermost disk to a second location beneath the bin and laterally of the first location, there being means for separating the disk from the moving means; means adjacent to said second location for forming a pair of collection stations; a selector plate pivotally mounted on the support at said second location; and means coupled with the selector plate for selectively pivoting the same relative to the support, whereby a separated disk can be directed to one or the other collection station as a function of the results of the task performed with the disk at said first location.

4,510,543

MAGNETIC HEAD SYSTEM FOR TAPE PLAYER

Hiroyuki Ohta, and Yutaka Masumoto, both of Tokorozawa, Japan, assignors to Pioneer Electronic Corporation, Tokyo, Japan

Filed Oct. 27, 1981, Ser. No. 315,519
Claims priority, application Japan, Oct. 31, 1980, 55-154820[U]; Dec. 3, 1980, 55-172672[U]; Dec. 3, 1980, 55-172674[U]; Dec. 9, 1980, 55-175554[U]; Dec. 29, 1980, 55-187930[U]; Jan. 16, 1981, 56-004288[U]
Int. Cl.³ G11B *5/55*
U.S. Cl. 360—106 **6 Claims**



1. A magnetic head system for a tape player capable of changing tracks in association of the magnetic tape by rotating the magnetic head comprising

a substantially cylindrical rotary member having a bore

axially extending to enclose a magnetic head therein and having an arm attached thereto, said rotary member further having gear means therearound;

a housing to hold said rotary member closely fit therewithin for axial rotation;

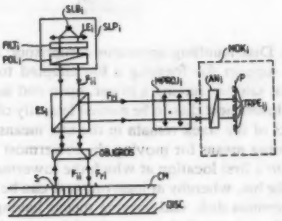
drive means in mesh with said gear means of said rotary member; said rotary member being adapted to be rotated by the driving means by substantially 180 degrees about an axis thereof whereas said housing is adapted to control the rotation of the rotary member by way of said arm.

4,510,544

OPTOELECTRONIC DEVICE FOR READING DATA CONTAINED ON A MAGNETIC MEDIUM

Jean-Pierre Lazzari, Montfort l'Amaury, France, assignor to Compagnie Internationale pour l'Informatique CII-Honeywell Bull, Paris, France

Filed Sep. 14, 1982, Ser. No. 417,904
Claims priority, application France, Oct. 16, 1981, 81 19543
Int. Cl.³ G11B *5/32*
U.S. Cl. 360—114 **7 Claims**



1. An optoelectronic reading device for reading data contained on a magnetic surface SM within a plurality of tracks TR_j of a carrier adapted to be driven past the reading device comprising:

a source (SLP_i) emitting a beam of polarized light F_{ij} onto the magnetic surface of the carrier at a particular area on said surface where direction of the magnetic state of the carrier at said surface area produces a rotation of the plane of polarization of the light;

means positioned to receive light reflected from the surface SM for detecting the angle of rotation of said plane comprising an analyzer (AN_j) of light and photoelectric transducer means ($TRPE_{ij}$) for delivering an electric signal in response to the reflected beam of light whose voltage or current is a function of the values of the data stored at said point;

optical means OBJGEROS for focussing the beam of light F_{ij} on a large field of observation on said surface area, enabling simultaneous observation of a plurality of tracks and a plurality of data on each track; and

projection means ($MPROJ_j$) for projecting the image of the carrier surface being viewed by said optical means through said analyzer and on.to a plane P where said photoelectronic transducers are positioned.

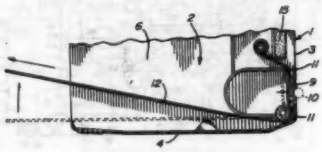
4,510,545

CAPSTAN CLEANER FOR EIGHT-TRACK CASSETTES

Normand Boudreau, P.O. Box 29, Lac-des-Iles, Canada J0W 1J0

Filed Sep. 13, 1982, Ser. No. 416,942
Int. Cl.³ G11B *5/41*
U.S. Cl. 360—128 **3 Claims**

1. A capstan cleaner for audio cassette players having a cylindrical capstan for moving the tape in the cassette during a playing mode, said cleaner comprising an elongated casing having open front and rear ends, a bottom wall, a cover with side walls extending between and connecting the bottom wall to the cover, said casing adapted to be inserted into an audio cassette player to replace a standard cassette with its front end adjacent said capstan, said cover having a cutout portion adjacent said front end and one of said side walls which is positioned to be aligned with said capstan, said cutout portion being arranged to allow a capstan cleaning wad within said casing, and forward biasing means to manually push said wad in contact with said capstan with said wad curved around a portion of said capstan, said biasing means including first and second upright members generally extending parallel to said capstan and a peg rigidly secured to and located within said casing adjacent said front end, said first and second upright members disposed on opposite sides of said cutout portion, said



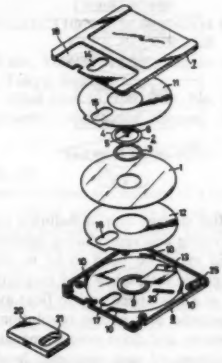
first upright member located between one of said side walls and said cutout portion transversely of said casing, said second upright member spaced from said first upright member along a line transverse of said casing, said peg disposed rearwardly of said line and near said second upright member, an elongated flexible band having an end attached to said peg and passing around and forwardly of both upright members with the portion of said band between said upright members disposed behind and in contact with a wad inserted within said casing through said cutout portion, said band then extending rearwardly within said casing and having its other end protruding from the rear open end of said casing to be manually grasped for exerting an adjustable pressure of said wad on said capstan.

4,510,546

FLEXIBLE MAGNETIC DISC CASSETTE

Shojiro Asami, Atsugi; Kazuo Ozawa, and Tetsuo Sawa, both of Tagajyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed May 27, 1982, Ser. No. 382,722
Claims priority, application Japan, May 30, 1981, 56-79828; Aug. 31, 1981, 56-129066
Int. Cl.³ G11B *5/016, 5/82, 3/62*
U.S. Cl. 360—133 **19 Claims**



1. A flexible magnetic disc cassette, comprising:

a flexible magnetic disc,

a cover means having an upper and lower half for containing said flexible magnetic disc,

a cleaning sheet having dimensions similar to the disc interposed as a liner between said lower half of the cover and said flexible magnetic disc so as to line an inside of the cover with respect to a surface of said disc, and

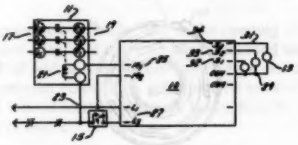
a flexible pressure means separate from the liner provided on an inner surface of said lower half for pressing a portion of said cleaning sheet against said flexible magnetic disc.

4,510,547

MULTI-PURPOSE COMPRESSOR CONTROLLER

George Rudich, Jr., Goshen, Ind., assignor to Johnson Service Company, Milwaukee, Wis.

Filed Nov. 12, 1982, Ser. No. 440,863
Int. Cl.³ H02H *7/00, 5/04*
U.S. Cl. 361—22 **8 Claims**



1. A controller for refrigeration and air conditioning compressor applications comprising:

hot motor detector means adapted to be coupled to a plurality of temperature sensors for detecting an over-temperature condition of a compressor motor, said hot motor detector means including the first logic switching means for generating a motor control signal;

sensor detector means coupled to said hot motor detector means and including a comparator and diodes connected to be conductive from sensor to comparator, said sensor detector means detecting only the simultaneous electrically shorted condition of all of said temperature sensors;

low voltage detector means coupled to said hot motor detector means for detecting a low line voltage condition;

short cycle protective means coupled to said first logic switching means for preventing short cycle operation of said controller;

pressure detector means coupled to said hot motor detector means for sensing a signal representative of lubrication oil pressure of said compressor, said pressure detector means being adapted for connection to a pressure transducer having a protective resistor internal thereto;

said pressure detector means further including means for providing a first starting time delay before enablement of said detector means and a second time delay for preventing disablement of said controller in the event of temporary diminishment of said oil pressure, said second time delay being significantly less than said first time delay;

power supply means coupled to said low voltage detector means for providing a source of electrical power to said compressor controller, and;

isolated output means coupled to said pressure detector means for controllably energizing said compressor motor.

4,510,548

ROTOR PROTECTION APPARATUS AND METHOD

David R. Boothman, Ennismore, Canada, assignor to General Electric Company, Salem, Va.

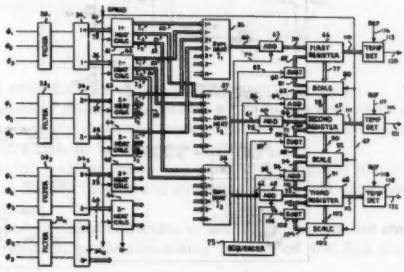
Filed Feb. 1, 1984, Ser. No. 575,751
Claims priority, application Canada, Feb. 11, 1983, 421423
Int. Cl.³ H02H *7/08*
U.S. Cl. 361—25 **17 Claims**

1. Apparatus for protecting an induction motor including a stator having a stator winding for connection to an alternating current supply of two or more phases and a squirrel cage rotor, said rotor having a plurality of conductors each having a starting portion and a main portion, currents of higher frequency induced in said conductors tending to be in said starting portion and currents of lower frequency tending to be in said main portion, said apparatus comprising:

means connected to said supply to said stator winding for determining values for positive sequence current components supplied to said stator winding and for providing first signals representing the positive sequence components,

means for providing a second signal as a function of the rotational speed of said rotor,

heat calculation means for receiving said first and second signals and deriving equivalent current values for each said component for at least said starting portions and main portions of said conductors that would generate equivalent heat therein,



summing means for summing the equivalent current values for each of said at least starting portions and said main portions of said conductors,

storage means for each of said at least said starting portions and said main portions of said conductors for receiving the respective equivalent current to store a value representing the temperature,

means connected between each said storage means representing thermal resistance to adjust the value in each storage means according to a heat transfer relationship,

means connected to at least one of said storage means representing thermal resistance to ambient to adjust the respective storage means for heat lost to ambient, and

temperature detector means connected to each storage means to determine if the value stored therein representing temperature exceeds a predetermined value representing a maximum temperature and for providing, when said stored value exceeds said predetermined value, and indication thereof.

4,510,549

POWER SUPPLY VOLTAGE MONITOR AND CONTROL SYSTEM

Jack Tedesco, Manhattan Beach, Calif., assignor to Econolite Control Products, Inc., Anaheim, Calif.

Filed Apr. 23, 1984, Ser. No. 602,684
Int. Cl.³ H02H *3/24*
U.S. Cl. 361—86 **4 Claims**

1. A voltage monitoring and control system for monitoring the voltage output of a power source for an electrically operative device and providing predetermined operative controls for said device when said voltage is not within a predetermined "normal" range or returns to said "normal" range comprising

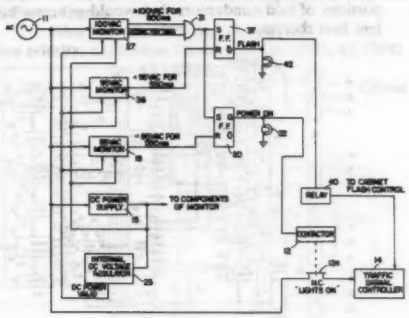
a first voltage monitor for sensing when the voltage goes below a first predetermined value below said "normal" range for a predetermined minimum time and providng a first output signal under such conditions,

a second voltage monitor for sensing when the voltage reaches a second predetermined value within said "normal" range for a predetermined minimum time and providing a second output signal under such conditions,

a third voltage monitor for sensing when the voltage goes below a third predetermined value between said first and second values and outside said "normal" range for a predetermined minimum time and providing a third output signal under such conditions,

first control means operatively connected to said first monitor and responsive to said first output signal for disconnecting said power source from said electrically operative device,

second control means operatively connected to said second monitor and responsive to said second output signal for reconnecting said power source to said device,



third control means operatively connected to said third monitor and responsive to said third output signal for initiating a predetermined mode of operation of said device,

a power supply for supplying a reference and operative voltage for said system, and

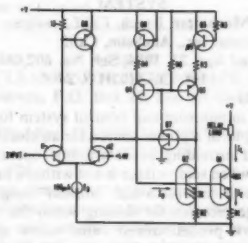
a fourth voltage monitor for sensing the voltage output of said last mentioned power supply, said first, second and third voltage monitors each being connected to said fourth voltage monitor to receive a reference voltage and a validating signal indicating that the output of said last mentioned power supply has at least a predetermined minimum value, said first control means operating to disconnect the power when the validating signal is not present.

4,510,550

RELAY DRIVER

Dewayne A. Spires, Plaistow, N.H., assignor to AT&T Bell Laboratories, Murray Mill, N.J.

Filed Dec. 16, 1982, Ser. No. 450,376
Int. Cl.³ H01H *47/32*
U.S. Cl. 361—152 **6 Claims**



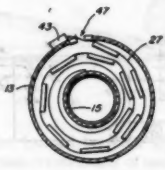
1. A relay driver circuit comprising a first transistor (Q1) having a relay load connected in its collector path, a second transistor (Q2) of similar conductivity type being coupled across the first transistor, the bases of said first and second transistors being connected together, and current mirror means (Q3–Q6) coupled from the collector of said second transistor to said bases to provide the additional base drive necessary to drive the first transistor towards saturation regardless of its Beta when maximum load current is required.

4,510,551

PORTABLE MEMORY MODULE

Edward C. Brainard, II, Marion, Mass., assignor to ENDECO Canada Limited, Halifax, Canada

Filed May 21, 1984, Ser. No. 612,459
Int. Cl.³ H05K *5/00*
U.S. Cl. 361—398 **6 Claims**



5. A portable memory module comprising:

a cylindrical outer casing;

a cylindrical inner casing generally concentric with said outer casing;

an end cap closing off said inner and outer casings at one end;

between said inner and outer casings, a helically rolled flexible printed circuit carrying and interconnecting a multiplicity of dual-in-line integrated circuit memory components oriented in columns with the pin lines parallel to the axes of said casings;

an annular cap closing off, at the other ends of said casings, the space between said casings

within said inner casing, a battery for powering said memory components; and a removable cap for closing off the other end of said inner casing.

4,510,552

DEVICE FOR HOUSING COMMUNICATION CIRCUITS AND EQUIPMENT

Takashi Kanno, Yokohama; Akira Oka, Tokyo; Ituo Okamoto, Kawasaki; Kouji Mizushima, Machida, and Shinji Oguro, Yokohama, all of Japan, assignors to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 18, 1982, Ser. No. 442,757
Claims priority, application Japan, Nov. 18, 1981, 56-183646; Nov. 19, 1981, 56-184361; Nov. 21, 1981, 56-186116
Int. Cl.³ H05K *1/14*
U.S. Cl. 361—413 **5 Claims**

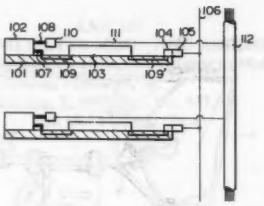
1. A device for housing communication circuits formed of a plurality of printed boards, each printed board having a print pattern formed thereon, front and rear ends and a connector disposed at the rear end of the printed board, and equipment, comprising:

a frame, for receiving the plurality of printed boards, having a plurality of frame connectors mounted thereon, said frame connectors being operatively connected to the connectors of the printed boards;

a plurality of circuit cables disposed along said frame, each said circuit cable having at least one connector attached thereto;

a test jack device, for testing the circuit formed on the printed board, disposed at the front end of each of the

printed boards, said test jack device including a plurality of jacks, each jack comprising a molded body having first and second leads extending therefrom, front and rear ends and an opening, said opening in said molded body being disposed at the front end of the printed board, said first and second leads being formed so that they are in electrical contact with each other in the opening of the jack and project from said rear end of said molded body, said first lead of said jack being connected to a circuit formed on the printed board by a print pattern printed thereon and said second lead of said jack being directly connected to one of said circuit cables.



4,510,553

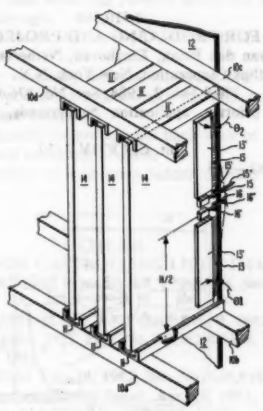
ELECTROMECHANICAL ASSEMBLY FOR ALIGNING, DISCHARGING, AND SEQUENTIALLY ENGAGING CONDUCTORS OF A P.C. BOARD WITH A BACKPLANE

David D. Faultersack, Escondido, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 24, 1983, Ser. No. 460,142

Int. Cl.³ H02H *7/20*

U.S. Cl. 361—413 **11 Claims**



10. An electromechanical assembly comprised of: a printed circuit board and a backplane, said backplane having first and second passages that extend completely through said backplane, ground and power conductors on said backplane that respectively border said passages, said board having only a single ground pin and a single power pin, said single ground and power pins extending in a cantilevered fashion past said board by relatively long and relatively short distances for sliding through said passages in a sequential fashion such that said circuit board receives a ground signal from said ground conductor before receiving any power signal from said power conductor.

4,510,554

CHIP-LIKE SOLID ELECTROLYTE CAPACITOR

Tsutomu Irikura, Joyo, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

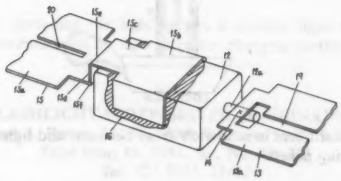
PCT No. PCT/JP82/00048, § 371 Date Oct. 22, 1982, § 102(e) Date Oct. 22, 1982, PCT Pub. No. WO82/02978, PCT Pub. Date Sep. 2, 1982

PCT Filed Feb. 23, 1982, Ser. No. 440,219

Claims priority, application Japan, Feb. 23, 1981, 56-25776

Int. Cl.³ H01G *9/00, 1/14, 5/01*

U.S. Cl. 361—433 **4 Claims**



1. A chip-like solid electrolyte capacitor comprising:

a capacitor element constituted by an anode body, and a sequentially deposited semiconductor metal oxide layer and a cathode layer on the anode body;

an anode lead-out line having a dielectric oxidizing film on one surface thereof and extending out of said capacitor element;

an anode terminal connected to said anode lead-out line and having an anode connecting portion on the free end thereof;

a cathode terminal connected to said cathode layer;

said terminals extending outwardly from the opposite end faces of said body of insulating resin;

said cathode terminal having a U-shaped fixing portion soldered to the cathode layer, a neck portion smaller in width than the fixing portion extending along and spaced from the surface of said capacitor element and having at most only a short length thereof adjacent said fixing portion soldered to said capacitor element, said cathode terminal further having a vertical portion extending along the end portion of said capacitor element and spaced therefrom and having first and second bent portion at the opposite ends, the first bent portion connecting said vertical portion to said neck portion, and an external cathode connecting portion extending from said second bent portion away from said capacitor element; and

a body of encapsulating insulating resin around said capacitor element, said anode lead-out line, and parts of said anode and cathode terminals, the anode and cathode connecting portions extending outside said body of insulating resin.

4,510,555

ORNAMENTAL LIGHTING DEVICE

Kei Mori, 3-16-3-501, Kaminoge, Setagaya-ku, Tokyo, Japan

Filed Feb. 27, 1984, Ser. No. 584,270

Int. Cl.³ F21V *7/04*

U.S. Cl. 362—32 **12 Claims**

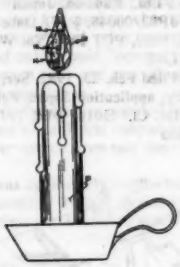
1. An ornamental lighting device for radiating condensed light which propagates through a fiber optic cable, comprising:

a pedestal;

a plurality of optical fibers supported by said pedestal and optically coupled with the fiber optic cable to be supplied with the condensed light;

retainer means for retaining said optical fibers substantially parallel to each other and at a predetermining spacing from each other; and

a pair of light transmitting panels mounted on the pedestal and mounting said retainer means to hold the parallel



optical fibers in sandwich array between said light transmitting panels.

4,510,556

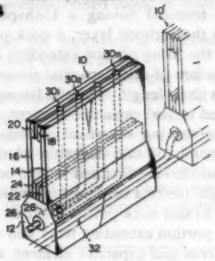
ELECTRONIC LIGHTING APPARATUS FOR SIMULATING A FLAME

David C. Johnson, 4190 Rochester Rd., San Diego, Calif. 92116

Filed Nov. 30, 1983, Ser. No. 557,347

Int. Cl.³ F21V *33/00*

U.S. Cl. 362—184 **7 Claims**



1. An electronic lighting apparatus for simulating a flame, comprising a plurality of electric lamps arranged vertically in spaced apart relationship, and control signal generator means for generating respective control signals for turning said lamps on and off in a manner so as to simulate both the illumination intensity distribution and the gas turbulence of a natural flame, said control signals operating to turn said lamps on and off in a random sequence, with the average proportion of time during which said lamps are turned on progressively increasing toward the lowermost of said plurality of lamps so as to obtain an average illumination intensity which progressively increases toward the lowermost of said plurality of lamps, and with the average duration of the intermittent periods during which said lamps are turned off decreasing progressively toward the lowermost of said plurality of lamps, whereby a flickering effect is obtained which is progressively more pronounced toward the uppermost of said plurality of lamps, thereby simulating the gas turbulence distribution of a natural flame.

4,510,557

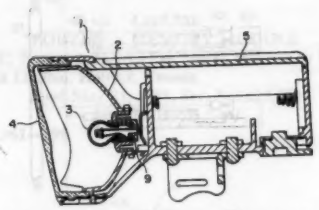
HEADLAMP DEVICE FOR BICYCLE, MOTORCYCLE AND THE LIKE

Sadaharu Tsuyama, Osaka, Japan, assignor to Tsuyama Mfg. Co., Ltd., Japan

Filed Oct. 19, 1983, Ser. No. 543,309

Int. Cl.³ F21L *9/00*

U.S. Cl. 362—188 **7 Claims**



1. A headlamp device for bicycles and the like vehicles, which includes a reflector, a bulb having its end fixedly inserted through an opening formed in said reflector, an illumination covering mounted on the front face of said reflector, and a casing attached integrally to the rear portions of these members, the improvement comprising an outwardly extending locking piece affixed to said end of said bulb, a cylindrical extension for the insertion of said end of said bulb is provided to the rear edge of said opening in said reflector, and the rear periphery of said cylindrical extension is stepped to define locking portions differing in axial length, said locking portions being engaged within said locking piece, there being two pairs of locking portions, each pair being of different axial length, whereby, when said bulb is fixedly inserted into said opening in said reflector, said locking piece can selectively be locked onto said locking portions differing in axial length.

4,510,558

DEVICE FOR PRODUCING AND PROJECTING LIGHT

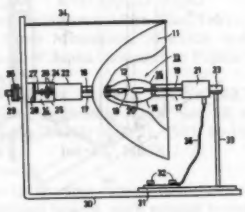
Hans G. van den Brink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 2, 1984, Ser. No. 576,492

Claims priority, application Netherlands, Feb. 21, 1983, 8300632

Int. Cl.³ F21V *7/20*

U.S. Cl. 362—263 **9 Claims**



1. A device for producing and projecting light, provided with a concave reflector with an optical centre, a short arc discharge lamp arranged with its discharge path near the optical centre and a lamp holder for at least mechanically securing the short arc discharge lamp, the lamp comprising a lamp envelope sealed in a vacuum-tight manner, filled with ionizable gas and having an ovoidal part enclosing the discharge space and two tubular parts extending therefrom at opposite ends thereof, each of which parts accommodates a respective current conductor having an electrode at its end located in the discharge space and at its other end being passed out of the

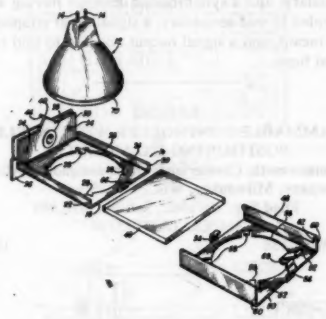
lamp envelope and being secured there to a metal lamp cap provided with a pin, the lamp holder having a metal tube for receiving the pin of the lamp cap and in the wall of said tube being provided with substantially radially directed screws for fixing the pin in the lamp holder, characterized in that the tube of the lamp holder has in its wall a substantially longitudinally extending gap, and a respective fixing screw in the proximity of the gap and on either side thereof.

4,510,559

LAMP AND FILTER MOUNTING ASSEMBLY

Paul J. Kristofek, Hickory Hills, Ill., assignor to McGraw-Edison Company, Rolling Meadows, Ill.

Filed Aug. 8, 1983, Ser. No. 521,037
Int. Cl.³ F21V *21/26*
U.S. Cl. 362—269 **26 Claims**



1. A lamp mounting assembly, comprising:
a lamp,
a lamp holder defining a planar lamp mounting plate,
an aperture in said mounting plate to allow the passage of light therethrough,
a substantially vertically inclined back wall on said lamp holder,
a substantially vertically inclined mounting bracket with a portion thereof being substantially flat and co-extensive with said back wall, and
means for rotatably mounting said back wall of said lamp holder to said mounting bracket,
to permit rotation of said lamp holder on said mounting bracket.

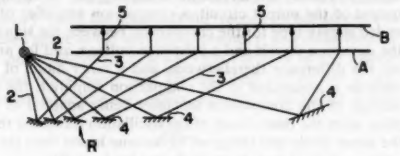
4,510,560

DEVICE FOR CONTROLLING LIGHT IMAGES

Masataka Negishi, 1000, Oaza Ryoke, Urawa-shi, Saitama-Ken, Japan

PCT No. PCT/JP82/00130, § 371 Date Dec. 7, 1982, § 102(e) Date Dec. 7, 1982, PCT Pub. No. WO82/03676, PCT Pub. Date Oct. 28, 1982
PCT Filed Apr. 20, 1982, Ser. No. 448,918
Claims priority, application Japan, Apr. 20, 1981, 56-58419
Int. Cl.³ F21V *13/04*; G02B *19/00*
U.S. Cl. 362—299 **24 Claims**

1. A device for controlling light images comprising:
light source means forming a light spot or light spot group;
reflection means positioned relative to said light source means for receiving all of the light rays from the light source means and reflecting the light rays; and
light direction changing surface means positioned relative to said reflection means for receiving the reflected light rays from the reflection means;
said reflection means having a generally planar fresnel mirror type reflecting surface having thereon a plurality of minute prism-shaped elements disposed in minute parallel ridges, the angles of the surfaces of the ridges causing the light to be reflected therefrom in non-parallel directions



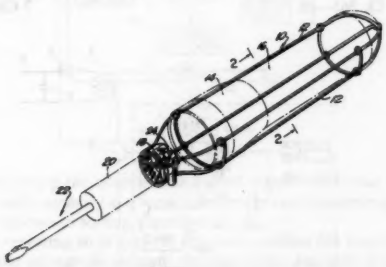
for spreading the light rays in a uniform light intensity distribution on the light direction changing surface means.

4,510,561

FLASHLIGHT-SCREWDRIVER COMBINATION

Raymond A. Peters, 521 W. 159th St., New York, N.Y. 10032

Filed Mar. 19, 1984, Ser. No. 591,271
Int. Cl.³ F21L *15/12*
U.S. Cl. 362—399 **1 Claim**



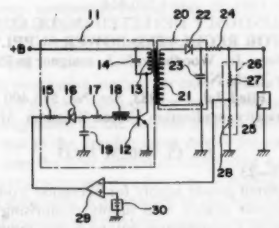
1. A flashlight holder comprising a wire basket of the approximate size and shape of the flashlight it is to contain, said basket being flexible and having an opening of the size and shape of the flashlight it is to contain, said opening being devoid of basket frame members permitting the flashlight to be manually squeezed therein and held thereby, said holder having an axially mounted screwdriver extending from its front end.

4,510,562

STABILIZING POWER-SUPPLY CIRCUIT

Yukio Maeba, Kyoto, Japan, assignor to Murata Manufacturing Co., Ltd., Japan

Filed Sep. 27, 1983, Ser. No. 536,198
Claims priority, application Japan, Sep. 28, 1982, 57-170617
Int. Cl.³ H02M *3/335*
U.S. Cl. 363—19 **14 Claims**



1. A stabilizing power-supply circuit comprising an oscillation circuit of collector tuning type including a base circuit of

an oscillation transistor and a tuning coil, an output circuit including an output coil, which is magnetically coupled to the tuning coil of the oscillation circuit, for producing an output voltage, a detection circuit for detecting the variation in the output of the output circuit, a comparison amplifier of single ended supply type for the comparison between the signal from the detection circuit and a reference voltage, and for amplifying the difference therebetween, and a zener diode of which cathode is connected to the comparison amplifier, the output voltage of the comparison amplifier being adapted to be applied upon the base circuit of the oscillation transistor through the zener diode and being set to become lower than the zener voltage of the zener diode in the no-load condition.

4,510,563

SWITCHING POWER SUPPLY

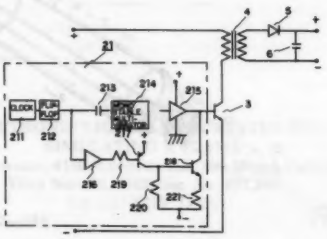
Takehisa Sato, Ora, Japan, assignor to Sanyo Electric Co. Ltd., Moriguchi and Tokyo Sanyo Electric Co., Ltd., Oizumimachi, both of, Japan

Filed Dec. 9, 1983, Ser. No. 560,196

Claims priority, application Japan, Feb. 25, 1983, 58-31436; Mar. 2, 1983, 58-35132

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—20 **7 Claims**



1. A switching power supply comprising:

a transformer having a primary winding which receives a DC input voltage,

a switching means comprising a switching transistor which periodically interrupts the primary current of said transformer,

a regulation means for regulating said switching means and for providing said switching transistor with a reverse base current a predetermined interval after the termination of a forward base current, said interval being approximately equal to the storage time of said transistor, whereby the base charge of said transistor is discharged during said interval,

a rectifier for rectifying the AC output of said transformer, and

a smoothing circuit for smoothing the DC output of said rectifier.

4,510,564

SYNCHRONOUSLY DETECTED DC/DC CONVERTER FOR REGULATED POWER SUPPLY

Harold G. Seer, Jr., Woodbury, N.J., assignor to RCA Corporation, New York, N.Y.

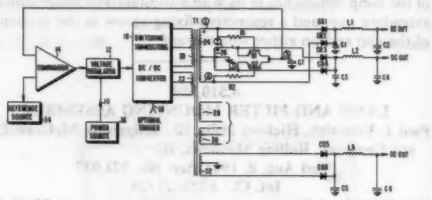
Filed Jul. 14, 1983, Ser. No. 513,400

Claims priority, application United Kingdom, Mar. 24, 1983, 8308100

Int. Cl.³ H02M *3/335*

U.S. Cl. 363—23 **6 Claims**

1. A regulated power supply for operation from an unregulated DC power source, said supply comprising a reference voltage source; a comparator having a first input coupled to said reference source, a second input, and an output; a voltage regulator having a first input coupled to said comparator output, a second input adapted to be coupled to said power source, and an output; switching means having an input coupled to said voltage regulator output, and an output; a transformer having a primary winding coupled to said switching means output, and a first secondary winding; coupling means for coupling to



said secondary; and a synchronous detector having a control input coupled to said secondary, a signal input coupled to said coupling means, and a signal output coupled to said comparator second input.

4,510,565

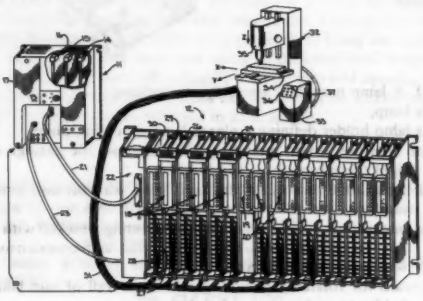
PROGRAMMABLE CONTROLLER WITH INTELLIGENT POSITIONING I/O MODULES

Ernst Dummermuth, Chesterland, Ohio, assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Sep. 20, 1982, Ser. No. 420,561

Int. Cl.³ G06F *15/46*

U.S. Cl. 364—136 **18 Claims**



1. An electrical controller for controlling machine motion through a plurality of electromechanical I/O positioning devices, the controller comprising:

a plurality of I/O circuits each connectable to a respective I/O positioning device to generate output drive signals thereto in response to move data, and to transmit a move request signal when move data is needed;

main processing means for storing and transmitting (i) user-selectable parameter data, including a user-selected mode of axis coupling designating coupled I/O circuits and independent I/O circuits and (ii) user-selectable move data, including coupled move data applicable to coupled I/O circuits and independent move data applicable to independent I/O circuits; and

master I/O processing means coupled to the main processing means for receiving the parameter data and the move data, and coupled to the I/O circuits for receiving move request signals, the master I/O processing means being responsive to the parameter data from the main processing means and to move request signals from any coupled I/O circuits to receive coupled move data in a single transmission from the main processing means and to distribute portions of the coupled move data to each of the coupled I/O circuits, the master I/O processing means also being responsive to

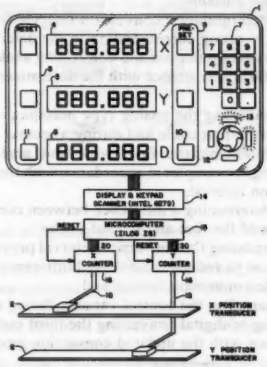
the parameter data from the main processing means and to move request signals from any independent I/O circuits to receive independent move data in a separate transmission from the main processing means and to couple the independent move data to the independent I/O circuit associated with that separate transmission.

4,510,566

MACHINE TOOL READOUT WITH AUTOMATIC CUTTER RADIUS OFFSET

Gary B. Gordon, 21112 Bank Mill Rd., Saratoga, Calif. 95070

Filed Sep. 27, 1982, Ser. No. 424,390
Int. Cl.³ G06F *15/46*
U.S. Cl. 364—190 **4 Claims**



1. Machine-tool digital position readout apparatus with automatic offset to compensate for a radius of a cutter moving relative to a workpiece, the apparatus comprising:

position-sensing means for determining a position of the centerline of the cutter;

input means for entering the size of the cutter;

direction-sensing means for sensing the direction of the motion of the cutter;

automatic-decision means responsive to the direction-sensing means for assigning a sign to the cutter radius depending on the sensed direction of motion, and for arithmetically combining the signed cutter radius with the position of the centerline of the cutter, to produce offset coordinates; and

display means for displaying the offset coordinates.

4,510,567

QUALIFYING AND SORTING FILE RECORD DATA

Philip Y. Chang, and John W. McInroy, both of Austin, Tex., assignors to International Business Machines Corp., Armonk, N.Y.

Filed May 18, 1981, Ser. No. 264,797
Int. Cl.³ G06F *7/00, 7/24*
U.S. Cl. 364—300 **8 Claims**

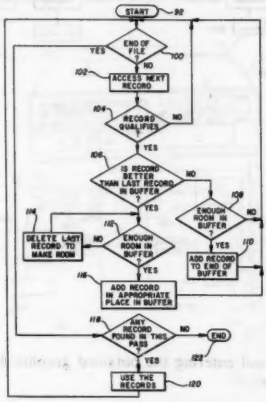
1. A method of qualifying and sorting file records from a mass storage means into a sort buffer memory for use in an office processing environment whereby the sort buffer memory provides a temporary retention of the file records in an order based on a selected ranking, comprising the steps of:

(a) accessing each of said file records in said mass storage means;

(b) evaluating an accessed file record in accordance with a chosen sort algorithm to determine if it qualifies for transfer to the sort buffer memory;

(c) if the accessed file record qualifies, then comparing a rank of the qualified file record in the mass storage means with the rank of a lowest ranked file record in the sort buffer memory;

(d) if the rank of the qualified file record is higher than the rank of the lowest ranked file record in the sort buffer memory, then the qualified file record is transferred to unused space in the sort buffer memory; and if the rank of the qualified record is lower than the rank of the lowest ranked file record, then the qualified file record is not transferred to the sort buffer memory if the buffer is full;



(e) placing the qualified file record transferred to the sort buffer memory at a level based on the rank determined by the chosen sorting algorithm;

(f) repeating steps (c)—(e) for each qualified file record in the storage means until the sort buffer has been loaded with the highest ranked records in the storage means without overflowing; and

(g) outputting said highest ranked records from said sort buffer.

4,510,568

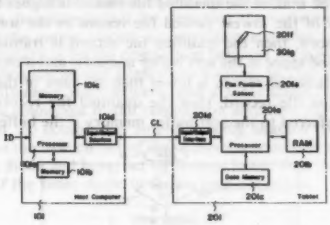
GRAPHIC PROCESSING METHOD

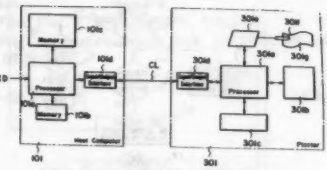
Hajimu Kishi, Hino, and Masaki Seki, Tokyo, both of Japan, assignors to Fanuc Ltd., Tokyo, Japan

PCT No. PCT/JP82/00192, § 371 Date Jan. 25, 1983, § 102(e) Date Jan. 25, 1983, PCT Pub. No. WO82/04339, PCT Pub. Date Dec. 9, 1982
PCT Filed May 25, 1981, Ser. No. 463,881
Claims priority, application Japan, May 25, 1981, 56-079045; May 29, 1981, 56-082894
Int. Cl.³ G06F *15/20*
U.S. Cl. 364—300 **4 Claims**

1. A graphic processing method for entering data into a host computer from a graphic input device and executing predetermined processing based on the entered graphic data, in which a processing unit in the graphic input device for entering the graphic data into the host computer comprising a computer, said method is characterized by a first step of storing a plurality of processing programs in a memory of the host computer, a second step of requesting a predetermined processing program in accordance with graphic processing to be executed in the graphic input device, a third step of transferring the requested processing program from the host computer to a rewritable

memory of the graphic input device, and a fourth step of executing graphic processing based on the transferred process-





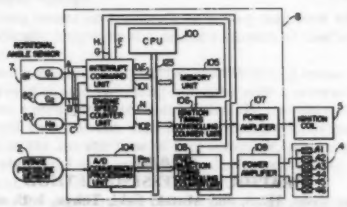
ing program and entering the obtained graphic data into the host computer.

4,510,569

A/D CONVERSION PERIOD CONTROL FOR INTERNAL COMBUSTION ENGINES

Mitsunori Takao, Kariya, and Toshika Ban, Oobu, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Jun. 22, 1982, Ser. No. 390,966
Claims priority, application Japan, Jun. 23, 1981, 56-96913
Int. Cl.³ G06F *15/20*; G05B *15/02*; H03K *13/02*
U.S. Cl. 364—431.12 **14 Claims**



1. In a method of controlling operation of internal combustion engine having an arrangement for analog-to-digital converting at least one analog type pulsating control variable indicative of engine operation including at least one of intake air pressure and intake air quantity, said method comprising the steps of:

detecting a cycle to cycle period of pulsation of the control variable;

determining a conversion interval for the analog-to-digital converting corresponding to the detected cycle to cycle period of pulsation and controlling analog-to-digital conversion in accordance with the determined conversion interval;

sampling the analog type pulsating control variable during a first cycle and during a second cycle immediately following the first cycle and analog-to-digital converting the samples in accordance with the determined conversion interval;

determining a difference between converted digital values of the first and second cycles;

updating the conversion interval previously determined so as to reduce the detected difference to update a next cycle conversion timing; and

sampling the control variable during a third cycle and analog-to-digital converting the third cycle sample in accordance with the updated conversion interval.

8. In an arrangement for controlling the operation of an internal combustion engine which includes a system for analog-to-digital converting at least one analog type pulsating control variable indicative of engine operation including at least one of intake air pressure and intake air quantity, said arrangement comprising:

means for detecting a cycle to cycle period of pulsation of the control variable;

means for determining a conversion interval for analog-to-digital converting corresponding to the detected cycle to cycle period of pulsation and controlling analog-to-digital conversion in accordance with the determined conversion interval;

means for sampling the analog type pulsating control variable during a first cycle and during a second cycle immediately following the first cycle and analog-to-digital converting the samples in accordance with the determined conversion interval;

means for determining a difference between converted digital values of the first and second cycles;

means for updating the conversion interval previously determined so as to reduce the detected difference to update a next cycle conversion timing; and

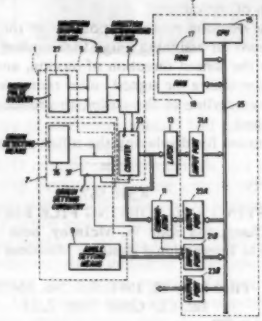
means for sampling the control variable during a third cycle and analog-to-digital converting the third cycle sample in accordance with the updated conversion interval.

4,510,570

CONTROL SYSTEM FOR PRESSES

Mikio Yonekura, Odawara, Japan, assignor to Amada Company Limited, Isehara, Japan

Filed Aug. 9, 1982, Ser. No. 406,170
Claims priority, application Japan, Aug. 12, 1981, 56-125257
Int. Cl.³ G06F *15/46*; B21D *5/02*
U.S. Cl. 364—476 **7 Claims**



1. A method for controlling a press by means of a microcomputer, comprising the steps of:

(a) generating a signal from a rotational angle detector mounted on a rotary driving means of said press;

(b) comparing the rotational angle detector signal with a predetermined stored rotational angle signal;

(c) storing a signal in said microcomputer when said rotational angle detector and predetermined stored signals coincide with each other; and

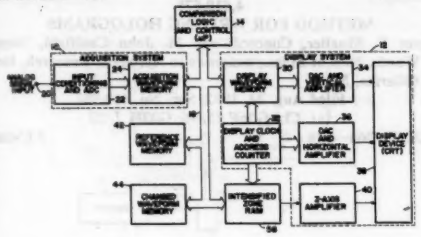
(d) actuating said press by means of said microcomputer

executing a program stored therein upon the performance of said storing step (c) such that said press performs a desired preprogrammed operation.

4,510,571
WAVEFORM STORAGE AND DISPLAY SYSTEM

Thomas P. Dagostino, Beaverton, and John D. Trudel, Tigard, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Oct. 8, 1981, Ser. No. 309,651
Int. Cl.³ G06F *3/14, 7/02;* G11C *15/00*
U.S. Cl. 364—487 **8 Claims**



1. A method of storing and displaying waveforms comprising the steps of:

receiving electrical signals and converting said signals to digital representations thereof to provide acquired waveforms;

storing a first acquired waveform as a reference in a reference waveform memory;

storing subsequently-acquired waveforms in an acquisition memory;

electronically comparing by comparison logic means said subsequently-acquired waveforms with said reference waveform and detecting a changed waveform with respect to said reference waveform; and

storing said changed waveform in a third waveform memory automatically upon said detection, wherein any of said memories may be coupled to a display system to display the contents thereof.

4. A waveform storage and display system, comprising:

means for receiving electrical signals and converting said signals to digital representations thereof to provide acquired waveforms;

a first waveform memory for storing a first acquired waveform as a reference waveform;

a second waveform memory for storing subsequently-acquired waveforms;

means for electronically comparing said subsequently-acquired waveforms with said reference waveform and detecting a changed waveform with respect to said reference waveform; and

means for storing said changed waveform in a third waveform memory automatically upon said detection.

4,510,572
SIGNATURE ANALYSIS SYSTEM FOR TESTING DIGITAL CIRCUITS

John M. Reece, King County; Robert G. Martin, Snohomish County, and John R. Franzel, King County, all of Wash., assignors to Data I/O Corporation, Redmond, Wash.

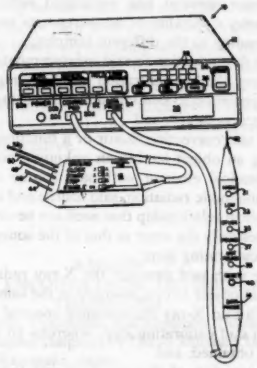
Filed Dec. 28, 1981, Ser. No. 334,880
Int. Cl.³ G06F *11/00;* G01R *31/28*
U.S. Cl. 364—489 **17 Claims**

1. A system for testing a digital circuit, comprising:

signature generation means receiving a digital signal from a node of said circuit for generating a signature word from said digital signal by combining each of a selected plurality of bits of said digital signature with preselected other ones of the selected plurality of bits of said digital signal;

control means for allowing said signature generation means to respond to said digital signal during a gate period which is synchronized to the operation of said digital circuit so that, at the conclusion of said gate period, said signature generation means provides a signature which characterizes said digital signal during said gate period;

signature memory means for storing respective signatures from a plurality of nodes of said digital circuit indicative



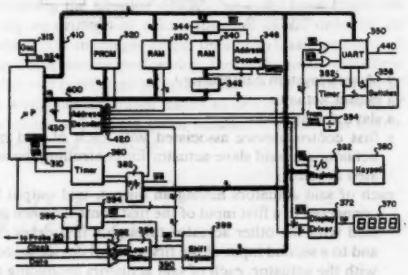
of the digital signals on the nodes of said digital circuit when it is operating correctly during said gate period; and

signature comparator means comparing the signature from said signature generation means with the signatures stored in said memory means until either a positive comparison is found or no positive comparison has been found after all of the signatures stored in said memory means have been compared, said signature comparator means generating a signature found indication in response to said positive comparison in response to all of said signatures being compared without a positive comparison.

4,510,573
METHOD FOR X-RAY FLUORESCENCE SPECTROSCOPY

William C. Boyce; Warren D. Wittekind, both of Richland; Leroy C. Howard, West Richland; Thomas E. Hall, Richland, and Wayne M. Lechelt, Benton City, all of Wash., assignors to UNC Nuclear Industries, Inc., Richland, Wash.

Filed May 6, 1981, Ser. No. 260,984
Int. Cl.³ G06F *15/46;* G01N *23/00*
U.S. Cl. 364—498 **58 Claims**



1. An X-ray fluorescence method for assaying the concen-

tration of a chemical element in an object using a source of particles or electromagnetic radiation having sufficient energy to produce X-ray fluorescence of said element and a detector capable of detecting a spectrum of X-ray fluorescence from said element, said method comprising the steps of:

calibrating the source and detector by:

irradiating with said source a group of samples of different known concentrations of the element to be assayed;

measuring with said detector the X-ray radiation received at the detector from said samples having energies in a first range which encompasses at least one X-ray fluorescence spectral line associated with said element, whereby a plurality of measurements are obtained corresponding to the different samples;

fitting a first equation to said measurements, said equation relating the concentration of the samples of known concentration to said measurements using at least a first correction factor; and

storing said correction factor or a function thereof;

irradiating an object having an unknown concentration of said chemical element with said source of particles or electromagnetic radiation, said source and object having a geometrical relationship that need not be controlled and is not necessarily the same as that of the source and samples in said calibrating step;

measuring with said detector the X-ray radiation received from said object having energies in the same range as that in which said X-ray fluorescence spectral line was measured in said calibrating step, whereby an assay measurement is obtained; and

using an equation of the same general form as said first equation to calculate from said assay measurement and said stored correction factor or function thereof the concentration of said chemical element in said object.

4,510,574

SERVOSYSTEM BETWEEN A MASTER ACTUATOR AND A SLAVE ACTUATOR

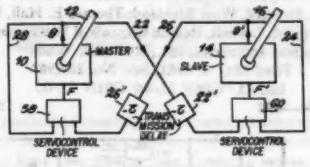
Jack Guittet, Les Ulis; Paul Marchal, Gif sur Yvette; Alain Micaelli, Arcueil, and Jean Vertut, Issy-les Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Aug. 23, 1982, Ser. No. 410,556

Claims priority, application France, Sep. 9, 1981, 81 17103

Int. Cl.³ G08C *19/00;* **G05B** *11/00;* **G05D** *3/00;* **B25J** *3/04*

U.S. Cl. 364—513 **6 Claims**



1. A servosystem comprising:

a master actuator;

a slave actuator;

a first control device associated with each of said master actuator and said slave actuator for controlling the associated actuator;

each of said actuators having an output, said output being connected to a first input of the first control device associated with the other actuator through a first delay device and to a second input of the first control device associated with the actuator, each of said actuators producing a first signal at said output;

each of said first control devices comparing the delayed first signal received at said first input and the first signal received at said second input and producing a first force signal in response thereto;

a second delay device connected to the output of the master actuator for delaying the first signal by an amount equal to the sum of the delay amounts of the two first delay devices; and

a second control device receiving and comparing said delayed first signal from said second delay device and said delayed first signal from said slave actuator for producing a second force signal in response thereto.

4,510,575

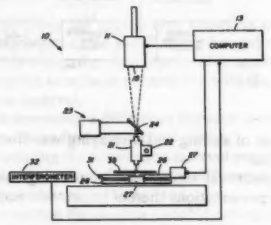
METHOD FOR WRITING HOLOGRAMS

Peter F. Mueller, Concord, and H. John Caulfield, Nagog Woods, both of Mass., assignors to Aerodyne Research, Inc., Billerica, Mass.

Filed Aug. 24, 1982, Ser. No. 410,901

Int. Cl.³ G06F *15/46;* **G03H** *1/22*

U.S. Cl. 364—518 **2 Claims**



1. A method of forming a hologram comprising

storing in a computer a program corresponding to a hologram to be produced in precise geometric arrangement throughout said hologram,

forming on an electronic display surface in response to signals from said computer corresponding to said stored program a first portion of said pattern and optically projecting said first portion in micro size to a precisely positioned portion of a photoreceptor,

mechanically moving said photoreceptor with respect to said electronic display surface essentially the required pattern distance for the projection of a next portion of said pattern and optically sensing the distance of the mechanical motion,

forming on said electronic display surface a next portion of said pattern while compensating in the position on said electronic display surface for the difference between the sensed portion of said photoreceptor and the required position of said receptor, and

repeatedly repeating a large multiplicity of times the steps of mechanically moving said photoreceptor, sensing the distance of motion, forming a next image on said display surface and compensating for the difference between sensed position and required position to form an entire hologram having constant geometric characteristics throughout the hologram.

4,510,576

SPECIFIC COEFFICIENT OF PERFORMANCE MEASURING DEVICE

J. Ward MacArthur, and James V. Radomski, both of Minneapolis, Minn., assignors to Honeywell Inc., Minneapolis, Minn.

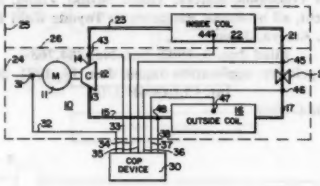
Filed Jul. 26, 1982, Ser. No. 401,993

Int. Cl.³ G01L *25/00, 3/26*

U.S. Cl. 364—551 **9 Claims**

1. A specific coefficient of performance measuring device for a mechanical vapor-compression system having a motor, a compressor driven by said motor, inside coil means, outside coil means, and fluid expansion means with said specific coeffi-

cient of performance measuring device including: power transducer means connected to said motor to measure the power supplied to said motor with said power transducer means having an electrical output indicative of the power drawn by said motor; a plurality of temperature sensing means connected to measure temperatures including the temperatures of an inlet and an outlet of said compressor, and an inlet and an outlet of said fluid expansion means with all of said measured temperatures being represented by electrical signals as outputs from said temperature sensing means; power loss storage means to store losses typical of said motor; pressure-enthalpy storage means to store the pressure versus enthalpy characteristics of

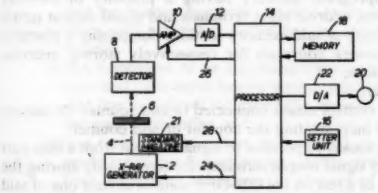


the mechanical vapor-compression system under test; temperature-entropy storage means to store the temperature versus entropy characteristics of the mechanical vapor-compression system under test; processor means having a plurality of input means connected to receive signals from said power loss storage means, said pressure-enthalpy storage means, said temperature-entropy storage means, said power transducer means, and said plurality of temperature sensing means; and output means for said coefficient of performance device connected to said processor means to provide a specific coefficient of performance for said system by said processor means determining the power delivered by said motor and by said processor means continuously determining said coefficient of performance.

4,510,577
NON-CONTACT RADIATION THICKNESS GAUGE

Tatsuo Tsujii, Tokyo, and Takaaki Okino, Fuchu, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Japan

Filed Feb. 18, 1982, Ser. No. 349,979
Int. Cl.³ G01B *15/02*
U.S. Cl. 364—563 **26 Claims**



26. A noncontact radiation thickness gauge system for measuring the thickness of a material which uses a plurality of movable standards of predetermined thickness values comprising:

a source of penetrating radiation;

means for detecting radiation from said source and producing output signals V functionally related to the level of radiation received where said level of received radiation is a function of the radiation absorption characteristic and thickness of material located in the radiation path between said source and said detecting means;

means for automatically inserting standards and the material to be measured into said radiation path;

memory means for storing calibration curve-defining parameters for a plurality of curves which correspond to respective ranges of thickness relating to corresponding output signals of said detecting means when said standards having respective thicknesses of calibration points are in said radiation path, where said calibration point are selected to approximate a geometric series of thickness values over all said ranges;

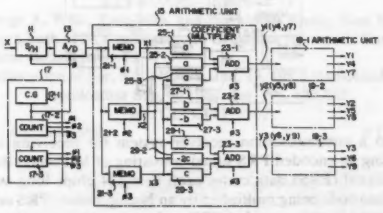
means for setting a nominal thickness and alloy compensation coefficient for the material to be measured which is within one of said plurality of ranges, said means providing an output signal indicative of said nominal thickness and alloy compensation coefficient; and

means for processing output signals of said detecting means and said setting means when said material to be measured is in said radiation path with a calibration curve stored in said memory means representing said one of said plurality of ranges to determine the thickness of said material, wherein the calibration curve used in said processing means is selected based on the thickness of the material to be measured belonging in the range which corresponds to said calibration curve.

4,510,578
SIGNAL ENCODER USING ORTHOGONAL TRANSFORM

Hiroshi Miyaguchi, Yokohama, and Hisaharu Takeuchi, Kawasaki, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

Filed Feb. 25, 1982, Ser. No. 352,236
Claims priority, application Japan, Mar. 4, 1981, 56-31042
Int. Cl.³ G06F *15/332*
U.S. Cl. 364—725 **8 Claims**



1. An encoder comprising:

means for sampling an input signal at a sampling frequency three times the frequency of the input signal to obtain a sampled signal, and

orthogonal transform means for concentrating the frequency components of the input signal into transform outputs by subjecting the sampled signal to an orthogonal transform using an orthogonal matrix function of the order of 3n (where n is an integer larger than unity), said orthogonal transform means performing the orthogonal transform using as a coefficient an orthogonal matrix of the order of 3n which has as a minor matrix an orthogonal matrix M of the order of 3 having given numbers a, b and c as matrix elements and defined as:

$$M = \begin{pmatrix} a & a & a \\ b & 0 & -b \\ c & -2c & c \end{pmatrix},$$

wherein said orthogonal transform means includes first means for performing an arithmetic operation of the following minor matrix arithmetic operation,

$$\begin{pmatrix} y1 \\ y2 \\ y3 \end{pmatrix} = \begin{pmatrix} a & a & a \\ b & 0 & -b \\ c & -2c & c \end{pmatrix} \cdot \begin{pmatrix} x1 \\ x2 \\ x3 \end{pmatrix},$$

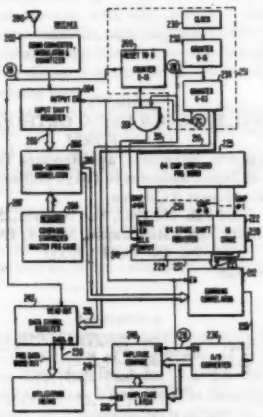
where y1 to y3 are transform outputs, and x1 to x3 are first to third sampled signals respectively sampled at different timings by clock signals each having a frequency one third that of the input signal sampling frequency.

4,510,579

FAST CORRELATION SYSTEM

Edward J. Nossen, Cherry Hill, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jul. 2, 1982, Ser. No. 394,820
Int. Cl.³ G06F 11/08
U.S. Cl. 364—728 4 Claims



1. In a communication receiver system for receiving and decoding an encoded PRS signal consisting of M Pseudo Random Signal (PRS) data codes each being N chips long with each data code being multiplied by an N chip master PRS code to form an N chip encoded PRS code and with a plurality of said N chip encoded PRS codes forming an encoded PRS signal, and with said M, N chip PRS data codes also forming a reference source PRS code comprised of overlapping and partially-in-common overlapping segments with said reference PRS code segments arranged in an order so that each of said received PRS data codes corresponds to a PRS reference code segment and in which the first chip of each received PRS data code segment begins correlation with that chip in said PRS reference source code which is removed X chips from the prior adjacent PRS reference PRS code segment and arranged in the same order as the PRS data codes in said source data code segments and correlating means for comparing each PRS reference code received segment with each received PRS data code, and comprising:

means for reproducing said master PRS code at said receiver;

means for correlating each successive group of N chips of said encoded PRS signal with a group of N chips, said group of N chips being defined as occurring when each new chip is received, means for multiplying each new group of N chips by said reproduced master PRS code to remove said master PRS code from the received encoded signal when a new group of N chips forms a new received encoded PRS code to thereby leave an N chip PRS data code;

means for generating said PRS reference source codes at said receiver; and

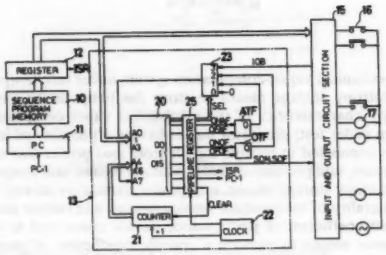
means for correlating each successive group of N chips, after being correlated with said master PRS code, with each successive segment of said PRS reference source code to determine the particular segment of said generated PRS reference source codes which has the greatest correlation with any group of N input chips, after correlation with said master PRS code, over N input chips.

4,510,580

PROGRAMMABLE SEQUENCE CONTROLLER

Toshihiko Yomogida, Kariya; Yasuo Suzaki, Ohbu, and Kyoji Ito, Aichi, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Jun. 3, 1982, Ser. No. 384,763
Claims priority, application Japan, Jun. 19, 1981, 56-95524
Int. Cl.³ G06F 3/04
U.S. Cl. 364—900 7 Claims



1. A programmable sequence controller comprising:

instruction generating means for successively and cyclically generating a plurality of sequence instructions each composed of an operation code for designating a type of instruction and an operand for designating one of input and output elements;

an I/O circuit section connected to said input and output elements and responsive to said operand of each generated sequence instruction for selecting one of said input and output elements;

a microprogram memory having a plurality of memory sections, address input terminals and signal output terminals, each of said memory sections comprising a plurality of memory addresses for respectively storing microinstructions;

a counter;

counter control means connected to said counter for successively incrementing the content of said counter;

test flag means responsive to signals output from a first part of said signal output terminals for temporarily storing the result of a test on the ON-OFF state of at least one of said input and output elements;

first line means for applying said operation code from said instruction generating means to a first part of said address input terminals so as to select one of said memory sections;

second line means for applying the content of said counter to a second part of said address input terminals;

third line means for applying the status of said test flag means and the ON-OFF state of one of said input and output elements selected by said I/O circuit section, to a third part of said address input terminals, said second and third line means enabling said microprogram memory to select one of said memory addresses composing a selected one of said memory stations;

fourth line means for applying a signal from a second part of said signal output terminals to said counter so as to reset the same; and

fifth line means for applying a signal from a third part of said

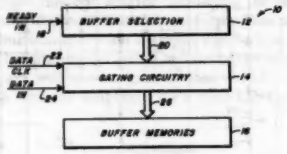
signal output terminals to said I/O circuit section so as to energize or deenergize one of said output elements selected by said I/O circuit section.

4,510,581

HIGH SPEED BUFFER ALLOCATION APPARATUS

Paul B. Cohen, Ashland, Mass., assignor to Prime Computer, Inc., Natick, Mass.

Filed Feb. 14, 1983, Ser. No. 466,079
Int. Cl.³ G06F *1/00*
U.S. Cl. 364—900 **8 Claims**



1. A data buffer array allocation circuit for directing incoming data to an available one of a plurality of buffer memories, said circuit comprising

a plurality of buffer selection circuits, each selection circuit being associated with one of said buffer memories and having

a clear input line,

a data ready input line,

a data ready output line, and

a buffer available line,

means for connecting said selection circuits in an ordered linear array, the data ready output line of an earlier buffer selection circuit of the linear array being connected to the data ready input line of a next succeeding buffer selection circuit, and

each said buffer selection circuit further comprising

means responsive to said data ready input line and said buffer available line, and

operable in a first state for effectively connecting said data ready input line to said data ready output line when said associated buffer has available data therein, and

operable in a second state for effectively isolating said data ready input line from said data ready output line when said associated buffer has no available data therein,

means responsive to an activating clear signal applied over said clear input line for setting said buffer available line to a signal indicating the absence of data in the associated buffer, and

means responsive to a data ready signal on said data ready input line for setting said buffer available line from said signal indicating the absence of data to a signal indicating the availability of data.

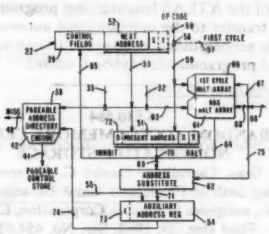
4,510,582

BINARY NUMBER SUBSTITUTION MECHANISM

Frederick T. Blount, Hopewell Junction, N.Y., assignor to International Business Machines Corp., Armonk, N.Y.

Continuation of Ser. No. 269,147, Jun. 1, 1981,. This application Jul. 13, 1984, Ser. No. 630,917
Int. Cl.³ G11C *7/00*; G08B *29/00*
U.S. Cl. 364—900 **2 Claims**

1. A binary number substitution mechanism including first and second storage arrays comprised of 2^n storage locations and 2^p storage locations respectively, each first and second storage array including access means for addressing and readout of data stored in the storage locations, m input binary signal lines, including an n-bit portion and a p-bit portion, for representing 2^m binary numbers, gate means, selectively and simultaneously interconnecting the n-bit portion to the access means of the first storage array, and the p-bit portion to the access means of the second storage array, and enabling means having an output signal connected to the gate means, and connected and responsive to one or more binary number representations of the m input binary signal lines, for causing readout of a substitute binary number from the first and second storage arrays comprised of n parallel output binary signal lines from the first storage array and p parallel output binary



signal lines from the second storage array, the improvement comprising:

register means comprised of m binary storage positions; and

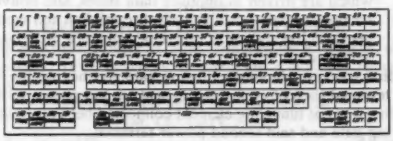
means simultaneously connecting the n parallel output binary signal lines from the first storage array to said register means in every other one of said binary storage positions, and the p parallel output binary signal lines from the second storage array to said register means in the other of said binary storage positions.

4,510,583

KEYBOARD TERMINAL

George A. Walz, East Islip, and Donald H. Kump, East Northport, both of N.Y., assignors to Grumman Aerospace Corporation, Bethpage, N.Y.

Continuation of Ser. No. 340,699, Jan. 19, 1982, abandoned. This application Sep. 7, 1984, Ser. No. 648,845
Int. Cl.³ G06F *3/02*
U.S. Cl. 364—900 **6 Claims**



1. An ATLAS language keyboard terminal specifically designed for automatically entering ATLAS language test programs into computerized automatic test equipment utilized for testing various electronic systems, comprising:

programmable keyboard means including a plurality of user activated definable keys for initiating single key activation of the unique keywords used in composing the ATLAS language test programs; and

preprogrammed microprocessor control means operatively connected to the computerized automatic test equipment and operatively connected and responsive to said plurality of user activated definable keys of said programmable keyboard means, said preprogrammed microprocessor control means generating a plurality of word character strings representing unique words of the ATLAS language test programs, each word character string of said plurality of word character strings representing a unique word of the ATLAS language test program and being initiated by a single stroke of a respective key of said plurality of user activated definable keys and automati-

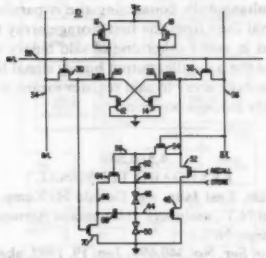
cally transferred by said preprogrammed microprocessor control means to a control computer associated with the computerized automatic test equipment so that ATLAS language test programs are inputted into the computerized automatic test equipment and automatic testing of the various electronic systems may be readily conducted by allowing the entry of ATLAS language test program words into the computerized automatic test equipment to be relatively error free and requiring a reduced amount of physical time and effort since the generation of an entire word of the ATLAS language test programs and its automatic transfer to the computerized automatic test equipment is accomplished in response to one keystroke entry on said programmable keyboard means.

4,510,584

MOS RANDOM ACCESS MEMORY CELL WITH NONVOLATILE STORAGE

Donald R. Dias, Carrollton; Daniel C. Guterman; Robert J. Proebsting, both of Plano, and Horst Leuschner, Lewisville, all of Tex., assignors to Mostek Corporation, Carrollton, Tex.

Filed Dec. 29, 1982, Ser. No. 454,418
Int. Cl.³ G11C *11/40*
U.S. Cl. 365—203 **37 Claims**



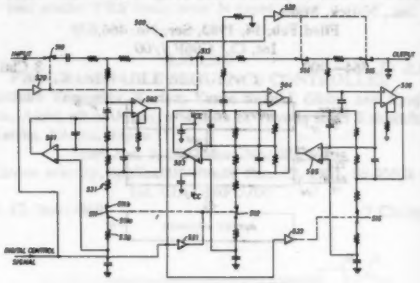
29. A nonvolatile random access memory cell comprising:
first and second power terminals,
a volatile memory circuit having first and second data nodes which are driven to opposite data states, said nonvolatile memory circuit receiving data through first and second bit lines and having one of said data states as a predetermined default state,
a first transistor having a floating gate and having the source terminal thereof connected to said second power terminal,
a first current tunneling element connected between said floating gate and said second power terminal,
a second current tunneling element connected between said floating gate and a first node which receives a store command signal,
a first capacitor connected between said floating gate and a second node,
a second transistor having the gate terminal thereof connected to said first data node, the source terminal thereof connected to said second power terminal and the drain terminal thereof connected to said second node,
a third transistor having the drain and source terminals thereof connected between said first node and said second node,
a second capacitor connected between said first node and the gate terminal of said third transistor,
a fourth transistor having the source terminal thereof connected to the drain terminal of said first transistor, the drain terminal thereof connected to said second data node and the gate terminal thereof connected to receive a recall command signal, and
a fifth transistor having the source and drain terminals thereof connected between said second data node and the gate terminal of said third transistor and having the gate terminal thereof connected to one of said bit lines.

4,510,585

ELECTRONIC FILTER

Franklin W. Mayo, and Miles A. Smither, both of Houston, Tex., assignors to Geosource Inc., Houston, Tex.

Filed Oct. 22, 1980, Ser. No. 199,536
Int. Cl.³ G01V *1/22*; H03K *17/16*
U.S. Cl. 367—43 **5 Claims**



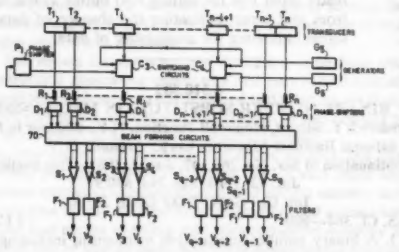
4. A multi-channel seismic exploration system having a plurality of groups of seismic detectors, the output of each group being connected to an input channel of said system, each input channel having a filter of order greater than one associated therewith, each of said filters comprising:
resistance elements;
capacitance elements, at least a portion of which are coupled to at least a portion of said resistance elements to form resistance-capacitance time constant circuits;
amplifier elements coupled to said time constant circuits; and
switches coupled to said time constant circuits, which switches open and close in response to a periodic switching signal and wherein said switches change the effective time constants of the filter by changing the effective resistance in said resistance-capacitance time constant circuits and wherein each amplifier terminal is isolated by a resistance element from each switch element in a circuit path with that terminal.

4,510,586

ARRAY SYSTEM WITH HIGH RESOLVING POWER

Georges Grall; Jacques Joseph, and Claude Lemoine, all of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Sep. 28, 1982, Ser. No. 425,703
Claims priority, application France, Jan. 8, 1982, 82 00236
Int. Cl.³ G01S *15/02*
U.S. Cl. 367—87 **6 Claims**



1. An array system for detecting waves, such as sonar waves, with high resolving power, comprising:
a transmitting array having a length L_E and including two transducers;
a receiving array having a length L_R which is longer than

L_E and wherein said receiving array includes a plurality of transducers placed along said length L_R;

a plurality of multiple-terminal phase shifters connected to said receiving transducers;

adding means connected to said receiver transducers to perform wave-detection beams covering transmission lobes one by one whereby said array system has an overall diagram with increased resolving power for each preformed beam; and

weighting means connected to said receiver transducers and to said phase shifters for weighting the amplitude of the input of said receiving transducers, for calculating a weighted function and for calculating the ratio of L_E/L_R in order to ensure that the secondary lobe maxima on the transmission-reception diagram will be less than −16 dB and that the angular width at 3 dB of the main lobe of said diagram will not be greater than $1.3\Delta\theta_1$ is the angular width without weighting for a ratio L_E/L_R equal to 1.

4,510,587

METHOD AND ARRANGEMENT FOR THE EVALUATION OF SIGNALS FROM AN ULTRASONIC DISPLACEMENT PATH MEASURING SYSTEM

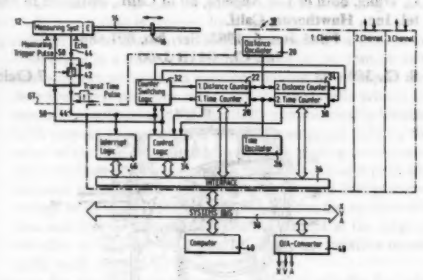
Otto Schneider, Grünichen, Switzerland, assignor to Maag Gear-Wheel & Machine Company Limited, Zürich, Switzerland

Filed Oct. 19, 1982, Ser. No. 435,328

Claims priority, application Switzerland, Oct. 30, 1981, 6933/81

Int. Cl.³ G01B 7/14, 17/00

U.S. Cl. 367—118 **9 Claims**



1. In a method for the evaluation of signals from an ultrasonic distance measuring system, especially for machine tools, comprising a magnetostrictive conductor along with which there can be displaced a measuring head containing permanent magnet means and by means of which there are transmitted trigger pulses which set a flipflop and lead to echo pulses in the permanent magnet means which reset the flipflop and are received by a stationary receiver at the measuring system, and within a signal transit time (herein referred to as transit time pulse) corresponding to the time between each trigger pulse and the received echo pulse there are counted in a distance counter the pulses generated by a distance oscillator as a measure for the displacement path between the permanent magnet means and a fixed reference point, the improvement which comprises the steps of:

(a) externally triggering the trigger pulses;

(b) counting in addition to the distance oscillator pulses counted during a transit time pulse the pulses of a time oscillator between a first trigger pulse and a second trigger pulse by means of a time counter;

(c) counting by means of a further distance counter the pulses of the distance oscillator during the next transit time pulse and counting by means of a further time counter the pulses of the time oscillator between the second trigger pulse and a third trigger pulse;

(d) computing from the determined counter states:

(i) the position of the measuring head

$$XG_n = NX_n \cdot \Delta x$$

wherein:

n = the last of a plurality of transit time pulses

XG_n = the measured position value after n-transit time pulses

NX = the number of distance counter pulses within a transit time pulse

Δx = distance increment = V_L/f_W = ultrasonic propagation velocity / distance oscillator frequency

(ii) the mean velocity of the measuring head

$$V_n = \frac{\Delta x}{\Delta t} \cdot \frac{NX_n - NX_{n-1}}{NT_n}$$

wherein:

V_n = the velocity of the measuring head after n-transit time pulses

Δt = the time increment = $1/f_T$ = 1/time oscillator frequency

NT_n = number of time counter pulses between the (n−1) and the n-th trigger pulse; and

(iii) a velocity-correction term for the position XG_n of the measuring head computed during step (i)

$$XV = V_n \cdot T_{Ln} = V_n \cdot (NX_n/f_W)$$

wherein: T_L = the time duration of the n-th transit time pulse; and

(e) delivering as the evaluation result the velocity-corrected measuring head position

$$XA = XG + XV$$

and/or the mean measuring head velocity V.

4,510,588

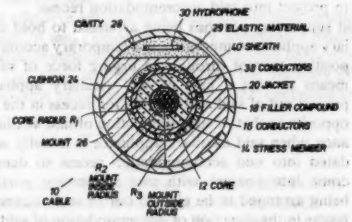
HYDROPHONE CABLE DECOUPLER

Vitold R. Kruka; Robert M. Kipp, and Edward R. Cadena, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Dec. 22, 1981, Ser. No. 333,526

Int. Cl.³ G01V 1/38

U.S. Cl. 367—165 **4 Claims**



1. A marine seismic cable comprising:

a cable core that is substantially cylindrical,

a housing adapted for holding an acoustic energy transducer that is substantially curved and the sizes of said cable core and said housing are defined by the equation

$$R_1R_3^2 + R_1R_2^2 - 2R_2^3 = 0$$

where,

R_1: radius of said cable core;

R_2: inside radius of said housing; and

R_3: outside radius of said housing, and

a body of elastic material positioned between said cable core and said housing.

4,510,589

SYSTEM FOR SECURING COMBINATION RADIO AND TAPE RECORDER

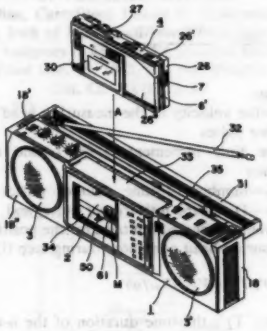
Hisao Ito, Osaka, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Dec. 31, 1981, Ser. No. 336,082

Claims priority, application Japan, Jan. 20, 1981, 56-7449

Int. Cl.³ G11B *31/00*

U.S. Cl. 369—11 **5 Claims**



1. A coupling/uncoupling device for use in a combination appliance including a main appliance combined with an auxiliary appliance, with said main appliance and said auxiliary appliance being arranged to be usable independently of each other, comprising:

an accommodation recess for accommodating said auxiliary appliance therein, which is formed in said main appliance;

a first locking member having a locking portion which is projected into said accommodation recess so as to lock said auxiliary appliance at an accommodating position thereof when said auxiliary appliance has been fully accommodated into said accommodation recess;

a supporting member having supporting portions which are urged at all times by urging means in a direction opposite to that of accommodation of said auxiliary appliance so as to project into said accommodation recess;

said supporting portions being arranged to hold said auxiliary appliance temporarily at a temporary accommodating position thereof through an urging force of said urging means so that a part of said auxiliary appliance may project out of said accommodation recess in the direction opposite to that of accommodation of said auxiliary appliance when said auxiliary appliance is initially accommodated into said accommodation recess so deeply as to come into contact with said supporting portions and, being arranged to be ejected out of said accommodation recess in the direction of accommodation of said auxiliary appliance so as to be moved to an ejecting position thereof when said auxiliary appliance is further accommodated into said accommodation recess so as to reach said accommodating position, with a force greater than the urging force of said urging means being applied to said auxiliary appliance in the direction of accommodation of said auxiliary appliance;

a second locking member for locking said supporting member at the ejecting position of said supporting portions; and

a lock releasing member associated with a lock releasing button, which actuates said first locking member and said second locking member so as to release locking of said auxiliary appliance at the accommodating position and locking of said supporting member at the ejecting position, respectively when said lock releasing button is operated;

all of said first locking member, said supporting member, said second locking member and said lock releasing member being provided in said main appliance;

whereby said auxiliary appliance is locked at the accommodating position by said first locking member and said supporting member is locked at the ejecting position by said second locking member when said auxiliary appliance has been fully accommodated into said accommodation recess so as to reach the accommodating position; and the locking of said auxiliary appliance through said first locking member and the locking of said supporting member through said second locking member are released simultaneously by said lock releasing member so as to push said auxiliary appliance up to the temporary accommodating position in the direction opposite to that of accommodation of said auxiliary appliance by said supporting member through the urging force of said urging means when said lock releasing button is operated.

4,510,590

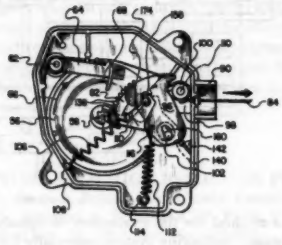
PULL STRING INERTIAL VOICE UNIT

Virgil M. Girton, Castaic; Gabriel Marason, Jr., and Lawrence C. Wang, both of Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Filed Jun. 6, 1983, Ser. No. 501,686

Int. Cl.³ G11B *3/00*

U.S. Cl. 369—63 **7 Claims**



1. In a phonograph device including a needle for tracking a sound track, a speaker cone and a tone arm having said needle depending therefrom, said tone arm transmitting vibrations from said needle to said speaker cone;

a flywheel rotatably mounted within said device including a shaft portion with a pinion;

actuating means including a sector gear pivotably mounted within said device for selectively engaging said pinion to suddenly impart a predetermined rotational force to said flywheel, said flywheel running down at a predetermined rundown speed subsequent to cessation of said force;

a record disc mounted on said flywheel and having at least one sound track engageable by said needle, said sound track being pre-recorded to match the rundown speed of said flywheel;

a spring operatively coupled to said sector gear; and

means coupled to said actuating means for engaging said needle with said sound track upon the imparting of said rotational force thereby to reproduce said sound track in response to rotation of said flywheel, the improvement comprising a pull string to operate said actuating means coupled to a sector clutch releasably attached to said

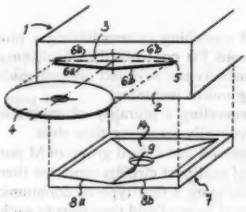
sector gear, said sector clutch moving from a rest position to an operating position upon pulling of said pull string and, said sector clutch moving said sector gear against the force of said spring until said sector clutch reaches its operating position where it contacts means to release said sector clutch, to thereby rotate said flywheel without releasing said pull string.

4,510,591

SLOT TYPE DISC RECORDER AND/OR PLAYER APPARATUS

Etienne A. Schatteman, Wemmel, Belgium, assignor to Staar S.A., Brussels, Belgium

Filed Nov. 15, 1982, Ser. No. 441,923
Claims priority, application Belgium, Dec. 10, 1981, 891428
Int. Cl.³ G11B *17/04, 19/16*
U.S. Cl. 369—77.1 **5 Claims**



1. In a disc recorder and/or player apparatus having a disc drive wherein a disc is rotated by a spindle,

a support for in-and-out sliding movement of a disc in its own plane in a transverse path relative to the spindle axis, said support including a member having a V-shaped surface with first portions extending to the spindle which are smoothly inclined and substantially symmetrically located with respect to said spindle which are engaged only by the edge of the the disc during in-and-out sliding movement, and a further portion extending transverse to said path and inclined toward said spindle into which said first portions merge so as to provide clearance between the surface of a disc and the surface of said member except at the edge of the disc to support the disc at the edge for relative movement with respect to the spindle, and

means for mounting said member and said spindle for relative movement axially of said spindle.

4,510,592

DISK CLAMPING DEVICE

Hitashi Kanamaru, and Fumio Kadoo, both of Saitama, Japan, assignors to Universal Pioneer Corporation, Tokyo, Japan

Continuation of Ser. No. 453,672, Dec. 27, 1982, which is a continuation of Ser. No. 225,090, Jan. 14, 1982, which is a continuation-in-part of Ser. No. 55,120, Jul. 5, 1979. This application Sep. 12, 1984, Ser. No. 649,973
Claims priority, application Japan, Jul. 5, 1978, 53-92501; Nov. 7, 1978, 53-152989
Int. Cl.³ G11B *3/62, 17/00*
U.S. Cl. 369—270 **22 Claims**

1. A disk clamping device, comprising:

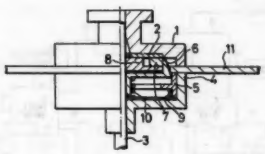
a turntable adapted to rotate a disk loaded thereon, and a spindle secured to said turntable for rotation therewith, said turntable being secured to said spindle at a predetermined height;

clamping means adapted to depress said disk against said turntable, said clamping means including a plate member;

a magnet and positioning means for positioning said magnet relative to said spindle, said magnet and said plate member forming a magnetic circuit in which magnetic flux is extended to clamp said disk to said turntable;

conical centering means for causing a center of said disk to coincide with an axis of rotation of said spindle when said disk is moved downwardly by said clamping means, whereby, said disk is clamped at a second predetermined height when said disk is brought into contact with said turntable; and

a movable ring having a substantially planar upper surface for supporting said disk, said movable ring being movably



supported on said turntable for parallel movement relative to said spindle, said movable ring being operable to maintain said disk horizontal as said clamping means depresses said disk into engagement with said turntable, first and second means for upwardly biasing said centering means and said movable ring, respectively, relative to said turntable.

4,510,593

INFORMATION DISK OF GROOVED, METAL-COATED CROSSLINKED POLYMERIC LAYER

Michael P. Daniels, Hastings, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 18, 1982, Ser. No. 434,970
Int. Cl.³ C08F *2/50;* **B32B** *27/08, 27/30*
U.S. Cl. 369—283 **7 Claims**

1. An information carrying structure comprising a circular disc having information encoded in grooves on at least one metal coated surface thereof, the composition of the surface beneath the metal comprising the crosslinked reaction product of:

a polymerizable composition free of non-polymerizable solvents comprising

(a) 7.5 to 45 percent by weight of a monoethylenically unsaturated monomer having a molecular weight between 80 and 500,

(b) 7.5 to 80 percent by weight of a diethylenically unsaturated monomer having a molecular weight between 100 and 3000,

(c) 7.5 to 50 percent by weight of an organic polymer, non-reactive with (a) and (b), having a molecular weight of at least 10,000 which is soluble in a solution of (a) and (b), and

(d) an effective amount of a latent free-radical initiator,

the ratio of said monoethylenically unsaturated monomer to said diethylenically unsaturated monomer being greater than 1 to 7 and less than 6 to 1, and the viscosity of the composition being between 20 and 20,000 centipoise at 20° C.

4,510,594

LOOP-AROUND TESTING FACILITIES FOR A MULTILINE PROTOCOL CONTROLLER

James M. Johnson, Jr., Glen Ellyn, Ill., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Mar. 31, 1983, Ser. No. 481,055
Int. Cl.³ H04J *3/14*
U.S. Cl. 370—15 **11 Claims**

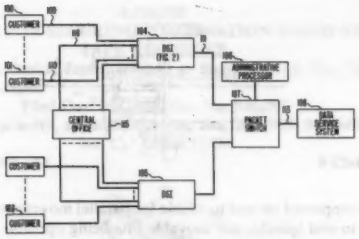
1. In a packet communication system having a plurality of customer interface units, a loop-around arrangement comprising

means responsive to a receipt of bit signals from said units

for forming said bit signals into receive byte signals associated with individual ones of said units;

means responsive to a receipt of transmit byte signals associated with individual ones of said units for disassembling said transmit byte signals into transmit bit signals;

means storing each of the transmit bit signals in association with individual ones of said units;



means responsive to a receipt of a loop signal for accessing the stored transmit bit signals associated with one of said units to transfer the accessed transmit bit signals to said forming means; and

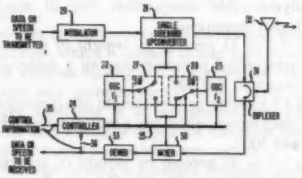
said forming means being further responsive to said transferred transmit bit signals for forming the transferred transmit bit signals into looped byte signals.

4,510,595

MODIFIED TIME-DIVISION TRANSMISSION TECHNIQUE FOR DIGITAL MOBILE RADIO SYSTEMS

Bernard Glance, Colts Neck, and Lawrence J. Greenstein, Edison, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 3, 1983, Ser. No. 538,329
Int. Cl.³ H04J *4/00*
U.S. Cl. 370—32 **9 Claims**



1. A method of transmitting digital radio signal bursts between two remotely located transceivers on a time-division basis, the method comprising the steps of:

at a first transceiver,

(a) receiving a first digital signal burst from a second remote transceiver on a first channel centered on a first radio frequency;

(b) after step (a), transmitting a second digital signal burst to the second remote transceiver on the first channel while concurrently receiving a third digital signal burst from the second remote transceiver on a second channel centered on a second radio frequency during at least a portion of the transmission period of the second signal burst, the second radio frequency being different than the first radio frequency;

(c) after step (b), transmitting a fourth digital signal burst to the second remote transceiver on the second channel while concurrently receiving a fifth digital signal burst from the second remote transceiver on the first channel during at least a portion of the transmission period of the fourth signal burst; and

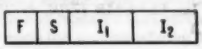
(d) after step (c), repeating steps (b) and (c) for subsequent digital signal bursts six through nine corresponding in steps (b) and (c) to that of digital signal bursts two through five, respectively.

4,510,596

TIME SLOT ASSIGNMENT FACILITIES

Philip W. Hartmann, Boulder; Dwight W. Kohs, Broomfield; Douglas A. Spencer, Boulder, and Garry V. Turnbow, Northglenn, all of Colo., assignors to AT&T Bell Labs, Murray Hill, N.J.

Filed Oct. 12, 1982, Ser. No. 433,821
Int. Cl.³ H04Q *11/04*
U.S. Cl. 370—58 **30 Claims**



1. In a PCM switching system having a plurality of port circuits and means for controllably establishing communication connections between selected ones of said port circuits, said establishing means including:

means for generating a plurality of unique time slots in a series of cyclically recurring time slots,

a first and a second and a third group of M port boards each having N of said port circuits mounted thereon,

means for providing a first type of communication service by applying N pairs of said time slots to each board of said first group wherein each port circuit on said boards receives a unique pair of said time slots, and

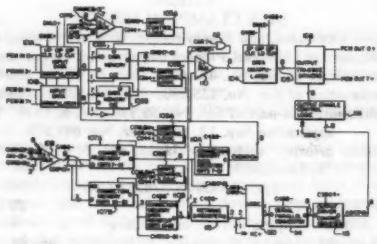
means for providing a second type of communication service by applying a first time slot of a different unique pair of said time slots to each port circuit on the ones of said port boards comprising a first half of said second and third groups of port boards and for applying the second time slot of each of said last named pairs to different ones of the port circuits on the port boards comprising a second half of said second and third groups of port boards.

4,510,597

TIME DIVISION SWITCHING MATRIX

Conrad Lewis, Nepean, Canada, assignor to Mitel Corporation, Ontario, Canada

Filed Dec. 3, 1981, Ser. No. 327,196
Int. Cl.³ H04J *3/00*
U.S. Cl. 370—66 **13 Claims**



1. A time division switching matrix comprising:

(a) means for receiving input signals divided into serial time slots according to a first sequence over a plurality of input lines;

(b) switching means for switching said signals to a plurality of output lines according to a second sequence,

(c) means for receiving control signals of one or more of first, second and third forms separately from said input signals from one or a plurality of control lines,

(d) means for controlling said switching means to estabilish said second sequence upon receipt of said control signals of a first form, and for controlling said switching means upon receipt of a second form of said control signals to output a third form of said received control signals to one or more of said plurality of output lines.

4,510,598

DIGITAL TRANSMULTIPLEXER

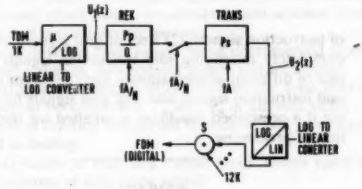
Heinz Göckler, and Helmut Scheuermann, both of Backnang, Fed. Rep. of Germany, assignors to Licentia Patent-Verwaltungs-GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 5, 1982, Ser. No. 405,583

Claims priority, application Fed. Rep. of Germany, Aug. 17, 1981, 3132378

Int. Cl.³ H04J *4/00*

U.S. Cl. 370—50 **5 Claims**



1. In a system for digital conversion between time division multiplex signals and frequency division multiplex signals comprising: an input terminal for receiving a digital multiplex signal to be converted; a plurality of digital bandpass filters, one for each channel of a frequency multiplex signal, with each said bandpass filter including means for changing the sampling rate of the multiplex channel signal received by the associated bandpass filter to the sampling rate of the converted multiplex channel signal; means connecting said input terminal to the input of each of said bandpass filters; and means for combining the output signals from each of said bandpass filters to provide the digitally converted multiplex signal; the improvement wherein each of said bandpass filters comprises a recursive filter and has a transfer function

$$H(z)=U2(z)/U1(z)=P(z)/Q(z^N)$$

wherein U1(z) and U2(z) represent the filter input spectra and filter output spectra respectively, P(z) and $Q(z^N)$ are the numerator polynomial and the denominator polynomial respectively of the transfer function H(z), $z=e^{j2\pi f/fA}$, f is the signal frequency processed in the bandpass fitter, fA is the sampling rate for the digital frequency multiplex signal, and fA/N is the sampling rate for the time division multiplex signal.

4,510,599

PRIORITIZED UNIDIRECTIONAL DISTRIBUTED BUS ACCESSING SYSTEM

Mehmet E. Ulug, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 4, 1983, Ser. No. 482,101

Int. Cl.³ H04J *3/02*

U.S. Cl. 370—85 **38 Claims**

1. A bus communication system, comprising:

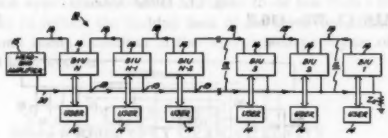
(a) a plurality of segments of a unidirectional transmit bus;

(b) a unidirectional receive bus such that information packets from said transmit bus are placed on said receive bus; and

(c) a plurality of bus interface units (BIUs) coupled in series with successive segments, respectively, of said transmit bus, each said BIU including a transmit bus input and a transmit bus output, said transmit bus input of each BIU being coupled, respectively, to the transmit bus output of the next upstream BIU, each said BIU also including a receive bus input connected to said receive bus, each said BIU being capable of transmitting an information packet of predetermined priority on said transmit bus, each said BIU including:

(1) a memory for storing a plurality of information packets to be transmitted; and

(2) a control circuit associated with said memory for



selectively operating said BIU in an active and a passive mode, said control circuit causing said BIU to operate as a repeater during said passive mode such that packets received on said transmit bus input are retransmitted on said transmit bus output and causing said BIU to operate as a transmitter during said active mode such that said BIU sequentially transmits said information packets stored in its said memory in accordance with said predetermined priority.

4,510,600

DIGITAL SIGNAL TRANSMISSION SYSTEM

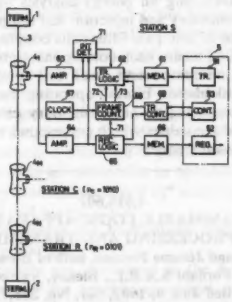
Yoichi Tan, Kanagawa, Japan, assignor to Fuji Xerox Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1982, Ser. No. 437,718

Claims priority, application Japan, Oct. 30, 1981, 56-172895

Int. Cl.³ H04J *3/00*

U.S. Cl. 370—94 **7 Claims**



1. A digital signal transmission system of the type wherein a plurality of stations transmit and receive digital information in packet form in a time division multiplex mode over a communication cable, each of said plurality of stations including transmitting means for transmitting a packet of information having a designation code representing a signal propagation delay time between said each station and a reference position on said cable, receiving means at each station for detecting said designation code, and means for determining the transmission tim-

ing of each station in accordance with the detection of the designation code of another of said plurality of stations.

4,510,601

DIGITAL FREQUENCY RECEIVER

Philippe Delpit, Paris; Philippe Duplessis, Colombes, and Yves Renaudin, Bougival, all of France, assignors to Compagnie Industrielle Des Telecommunications Cit-Alcatel, Paris, France

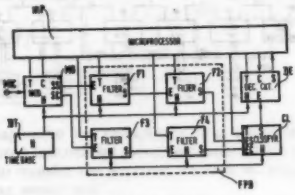
PCT No. PCT/FR81/00084, § 371 Date Feb. 12, 1982, § 102(e) Date Feb. 12, 1982

PCT Filed Jun. 25, 1981, Ser. No. 348,543

Claims priority, application France, Jun. 25, 1980, 80 14090

Int. Cl.³ H04J *3/12*

U.S. Cl. 370—110.3 **9 Claims**



1. A digital frequency receiver connected to a processor for the recognition of multifrequency code signals received in signalling time slots and transmitted to the receiver in digital form by at least one PCM time multiplex link, the receiver including means for modulating the received signals with signals whose frequencies correspond to the code used and which are supplied by a digital generator modulating the signal in each of plural time-slots of the time multiplex link by the sine and cosine components of each code frequency, means for low-pass filtering the modulated signals and means for analysing the energy contained in the spectrum of the signals received in the neighborhood of the code frequency;

said receiver comprising:

a time base generator synchronized with data on said PCM time multiplex link for supplying in each time slot (BT) phase signals (ba to bd, A) for successively enabling circuits of the receiver;

means for testing predetermined conditions respecting energy levels for each time slot using a processor operating in response to said time base generator, said testing means including an energy-analysis unit, a generator control memory and injection and sampling means; and

two groups of low-pass filter cells coupled to said testing controlling means each corresponding to one of the sine and cosine components, each cell comprising a recurrence calculation circuit operating based on a finite difference equation and a memory circuit for storing intermediate values which correspond to each time slot and to each frequency.

4,510,602

PROGRAMMABLE LOGIC APPARATUS FOR ENTERING, PROCESSING AND TRANSMITTING DATA

Jean Engdahl, and Jérome Formaz, both of Bienne, Switzerland, assignors to Fordahl S.A.R.L., Bienne, Switzerland

Filed Jun. 9, 1982, Ser. No. 386,798

Claims priority, application France, Jun. 24, 1981, 81 12908

Int. Cl.³ G11C *13/00*

U.S. Cl. 371—21 **10 Claims**

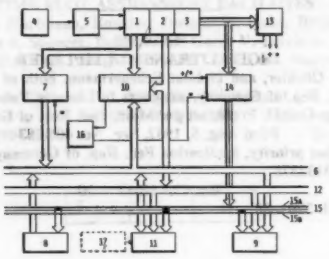
1. Programmable logic apparatus comprising

first memory means for storing only instruction signals;

second memory means, separate from said first memory means, for storying only grid signals which permit said instruction signals to be taken partly or completely into account;

third memory means, separate from said first memory means and said second memory means, for storing only pairs of address signals at each storage location of said third memory means;

means for addressing said first memory means, said second memory means and said third memory means cyclically and in synchronism for simultaneously extracting (1) a set



of instruction signals, (2) a set of grid signals for partly or completely modifying said instruction signals and (3) a pair of different address signals; and means for comparing said instruction signals and said grid signals for determining if a prescribed condition is satisfied for the continuation of processing.

4,510,603

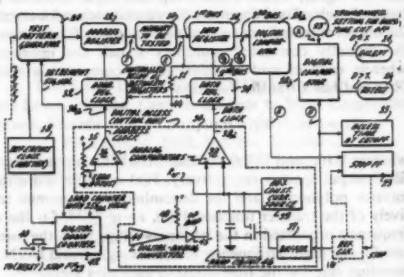
TESTING SYSTEM FOR RELIABLE ACCESS TIMES IN ROM SEMICONDUCTOR MEMORIES

Robert D. Catiller, Garden Grove, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 267,072, May 26, 1981, abandoned. This application Nov. 25, 1983, Ser. No. 555,441

Int. Cl.³ G06F *11/14, 11/24*

U.S. Cl. 371—21 **5 Claims**



1. In a testing system for determining the reliable access time of a ROM memory being tested, the combination comprising:

(a) address means to apply address-data to a ROM memory-being-tested at a time T_a and to decrement a down counter;

(b) means to place output memory data from said memory-being-tested on a first and second data output bus each of said memory data being respectively designated as first memory output data and second memory output data;

(c) means to temporarily store said output memory data on said first data output bus in a data latching register means;

(d) means to connect said second output bus to a second input port of a digital comparison means;

(e) third bus means to transmit said memory output data from said data latching register means to a first input port of said digital comparison means at a time T_d;

(f) said digital comparison means including:

(f1) a second input port for receiving said memory output data after a moment in time, T_a when said ROM memory is addressed;

(f2) a first input port for receiving said memory output data at a time T_d;

(f3) means for comparing each bit of data on said second input port with each corresponding bit of data on said first input port;

(f4) means for generating an error signal when corresponding data bits on said first and second input ports fail to indicate an equality;

(g) timing control means including:

(g1) means to generate a first time-control signal, T_a, for enabling said address means to apply address-data to said ROM memory and for enabling said memory output data to be received by said second input port of said comparison means;

(g2) means to generate a second time control signal, T_d, for enabling transfer of memory output data from said data latching register means, via said third bus means to said first input port of said digital comparison means;

(g3) master clock means for clocking said address means and said down counter means;

(g4) said down counter means being decremented from a preset value by said address means and including:

(g4a) means to sequentially diminish the time interval period between time T_d and T_a in discrete steps;

(g5) a stop flip-flop connected to receive said error signal and including:

(g5a) means to stop said master clock means upon occurrence of said error signal;

(h) said ROM memory being tested having connections to receive address-data from said address means and connections to respectively convey said first and second memory output data to said first and second output bus;

(i) said first and second data output bus connected to said ROM memory for respectively transmitting, simultaneously, said memory output data to said data latching register means and to said second input port of said comparison means;

(j) said data latching register means for temporarily storing said memory output data for a time interval period, T_d minus T_a, said latching register means including:

(j1) means to receive said first memory output data via said first data output bus;

(j2) means to convey said first memory output data via said third bus means to said comparison means.

4,510,604

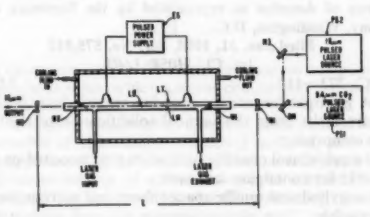
OPERATION OF A TWO-PHOTON THREE LEVEL LASER

Lyle H. Taylor, Murrysville, and William H. Kasner, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 195,906, Oct. 10, 1980, Pat. No. 4,375,689. This application Nov. 12, 1982, Ser. No. 441,129

Int. Cl.³ H01S *3/097*

U.S. Cl. 372—4 **2 Claims**



1. A method for improving the performance of two-photon, three level laser system including a laser medium disposed within a laser discharge region including spaced apart optical elements defining an optical cavity within said laser discharge region, wherein lasing occurs at two wavelengths with the lower laser level of the first lasing transition being the upper laser level of the second lasing transition, the intensity I of the second photon laser flux within the laser cavity defined by spaced apart optical elements being approximately equal to $I_o e^{Na\ell/L}$ where α is the gain of the laser medium; l is the length of the laser medium; L is the distance between the optical elements; N corresponds to the number of passes within the laser cavity; and I_o is the initial intensity, comprising the step of:

positioning said spaced apart optical elements at a distance L which approximates but is not equal to or less than l in order to reduce the buildup time of the laser flux of the second lasing transition in the laser discharge region of said laser system.

4,510,605

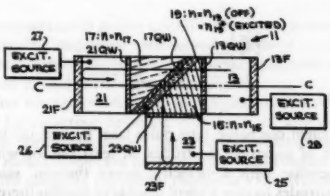
DUAL FREQUENCY OPTICAL CAVITY

E. Victor George, Livermore, and John F. Schipper, Palo Alto, both of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Mar. 21, 1983, Ser. No. 477,456

Int. Cl.³ H01S *3/10*

U.S. Cl. 372—23 **6 Claims**



1. Apparatus for generating two distinct laser frequencies ν_1 and ν_2 in an optical cavity, the apparatus comprising:

a T-shaped optical cavity comprising two arms, a base and a junction region lying between the two arms and the base and having two substantially 45°-45°-90° prisms of material of refractive index n_1 positioned in the junction region of said T-shaped cavity, each prism having a hypotenuse face being adjacent and parallel to but spaced apart from the other by a gap region. with the prisms' hypotenuse faces being oriented at 45° to a horizontal line defined by a first and second arm of said T-shaped cavity;

a first excitable gas positioned in the gap region between the two prisms and, having a predetermined refractive index n_2 in its unexcited state and a predetermined refractive index $n_2^* > n_2$ in its electrically or optically excited state, the refractive indexes n_1, n_2 and n_2^* satisfying the relations $n_1/n_2 > \sqrt{2}$ and $n_1/n_2^* < \sqrt{2}$;

first excitation means for controllably and intermittently exciting the first gas;

a second excitable gas, contained in the first arm of said T-shaped cavity for amplifying optical radiation of frequency ν_2 when the second gas is excited;

second excitation means for controllably and intermittently exciting the second gas;

a third, excitable gas, contained in the base of said T-shaped cavity for amplifying optical radiation of frequency ν_1 when the third gas is excited;

third excitation means for controllably and intermittently exciting the third gas;

a first mirror, positioned on an exposed vertical face of the arm of said T-shaped cavity containing the second excit-

able gas and being substantially 100 percent reflecting for incident optical radiation of frequency ν_2; and

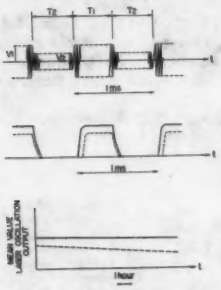
a second mirror, positioned on an exposed horizontal face of the base of said T-shaped cavity and being substantially 100 percent reflecting for incident optical radiation of frequency ν_1.

4,510,606

SILENT DISCHARGE TYPE PULSE LASER DEVICE

Shigenori Yagi, Kobe; Masaki Kuzumoto, Amagasaki; Masaaki Tanaka, Nagaokakyo, and Shuji Ogawa, Nishinomiya, all of Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 9, 1982, Ser. No. 387,262
Claims priority, application Japan, Jun. 17, 1981, 56-93137
Int. Cl.³ H01S 3/097
U.S. Cl. 372—25 8 Claims



1. A silent discharge type pulse laser device, comprising:

a pair of opposing electrodes, at least one of which is an electrode with a dielectric cover thereon, said pair of electrodes having a silent discharge section therebetween;

a laser resonator consisting of a total reflection mirror and a partial reflection mirror mounted opposite to each other with said silent discharge section in between;

a source of high frequency voltage for supplying to said pair of electrodes a high frequency voltage having a predetermined period for silent discharge;

and a control means for controlling said high frequency voltage from said source with respect to a first interval and a second interval that form a period which is longer than said period for silent discharge;

wherein said high frequency voltage being supplied to said silent discharge section across said pair of electrodes is at a first peak voltage value during said first interval and at a second peak voltage value during said second interval, said first peak voltage value being sufficient to excite laser oscillation and said second peak voltage value being sufficient to cause a discharge but insufficient to excite laser oscillation.

4,510,607

SEMICONDUCTOR LASER END-FACET COATINGS FOR USE IN SOLID OR LIQUID ENVIRONMENTS

Graham A. Garcia, and Steven J. Cowen, both of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jan. 3, 1984, Ser. No. 567,594
Int. Cl.³ H01S 3/18
U.S. Cl. 372—49 4 Claims

1. An improved semiconductor laser having improved transmission characteristics when transmitting in a liquid or a transparent solid medium having an index of refraction n_m comprising:

a first dielectric coating disposed on an end-facet of the semiconductor laser having an index of refraction n_1; and

a second dielectric coating disposed on the first dielectric coating having an index of refraction n_2, the materials of the dielectric coatings are selected such that $n_1/n_2=n_m$.

4,510,608

LASER TUBE UTILIZING NEGATIVE GLOW

Kanichi Fujii, and Masahiro Otaka, both of Hitachi, Japan, assignors to Mita Industrial Co., Ltd., Japan

Filed Feb. 22, 1982, Ser. No. 350,965
Claims priority, application Japan, Aug. 28, 1981, 56-134337
Int. Cl.³ H01S 3/097
U.S. Cl. 372—87 25 Claims

1. In a laser tube including an anode and a hollow cathode and adapted for laser oscillation utilizing a negative glow generated in a space within the hollow cathode, the improvement wherein said laser tube includes an elongate cylindrical member in which the anode and the hollow cathode are disposed opposite to each other, means are included electrically insulating the anode from the cylindrical member, an active vaporizable metal is provided in the cylindrical member closely adjacent the outer surface of the hollow cathode, and in contact with said cylindrical member and a plurality of holes for communication between the internal space of the hollow cathode and the space outside thereof are formed in the hollow cathode.

4,510,609

FURNACE FOR VERTICAL SOLIDIFICATION OF MELT

Jaroslav L. Caslavsky, Lexington, Mass.; Gerald H. Lavoie, Pembroke, N.H.; William H. Earle, Randolph, and Dennis J. Viechnicki, Wellesley, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 31, 1984, Ser. No. 575,613
Int. Cl.³ H05B 3/40
U.S. Cl. 373—110 7 Claims

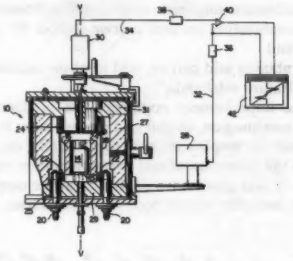
1. A gas-tight furnace for growing crystals from high temperature melts using the vertical solidification of melt technique comprising:

(A) a cylindrical crucible open at its top, mounted on a heat sink, for containing said melt;

(B) a cylindrical muffle spaced from and surrounding said crucible;

(C) vertically mounted heating rods spaced from said muffle and essentially uniformly spaced around the exterior of said muffle in a circular configuration;

(D) an electrically conducting continuous top ring which is electrically connected to the top of all of said heating rods;
(E) separate semi-circular ring sections electrically connecting said heating rods at their bottom ends;
(F) a thermal insulating layer of electrically conductive graphite completely enclosing elements (A) through (E) within said furnace; and,
(G) more than two electrically conducting power feeds brought from the exterior of said furnace and passing



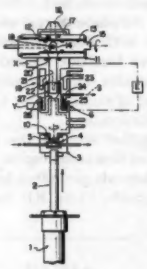
vertically through openings in said electrically conductive insulation in the bottom of said furnace to essentially vertical electrical connection with said separate semi-circular rings and having essentially uniformly spaced distances between each power feed to deliver electric current into and out of said furnace to develop heat in the heating rods, wherein the thermal environment is maintained so that there are essentially no thermal gradients in planes perpendicular to the vertical axis of the crucible.

4,510,610

EXTRACTIVE FURNACE FOR EXTRACTING GASEOUS COMPONENTS FROM MATERIAL SAMPLES

Yoshinori Hosokawa; Masahiro Tanimoto, and Katsuya Tsuji, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Oct. 13, 1983, Ser. No. 541,733
Claims priority, application Japan, Oct. 30, 1982, 57-191702
Int. Cl.³ H05B *3/00*
U.S. Cl. 373—118 **7 Claims**



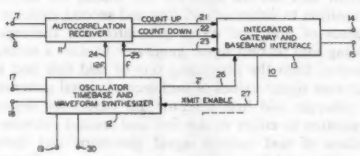
1. An extractive furnace for extracting gaseous components from material samples, which gaseous components are then to be analyzed, said furnace comprising:
upper and lower electrodes mounted to press therebetween a crucible of electrically conductive material, such that the application of an electric current to said electrodes will cause heating of a material sample adapted to be contained in the crucible, thereby extracting gaseous components from the material sample; and
means rotating at least one of said upper and lower electrodes about a vertical axis, and thereby causing surfaces of the crucible contacting respective surfaces of said upper and lower electrodes to rotate under friction against said respective surfaces, thereby improving electrical contact between the crucible and said electrodes.

4,510,611

TRANSCEIVER CIRCUIT FOR INTERFACING BETWEEN A POWER LINE COMMUNICATION SYSTEM AND A DATA PROCESSOR

John J. Dougherty, Avon, Conn., assignor to General Electric Company, Portsmouth, Va.

Filed Nov. 19, 1982, Ser. No. 442,982
Int. Cl.³ H04B *1/38*; H03D *1/00*
U.S. Cl. 375—8 **14 Claims**



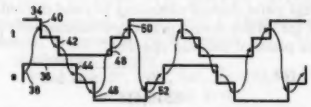
9. An autocorrelation receiver for connection between a power line and a data processing bus in a power line communication system employing amplitude shift keying modulation of broadband signals on the power line and base band signals on the data processing bus, said autocorrelation receiver comprising:
digital autocorrelation means connectable to said power line for receiving amplitude shift keyed signals of a carrier frequency signal and providing an output indicative of the detection of said carrier frequency signal;
digital filter means connected to said digital autocorrelation means for rejecting detached harmonics of said carrier signal in the output of said digital autocorrelation means;
samp'ing means connected to the output of said digital filter means for sampling the output thereof at a rate which is an integral multiple of said carrier frequency signal; and
digital averaging means connected to the output of said sampling means for averaging the output thereof over one period of said carrier frequency signal.

4,510,612

SYSTEM COMPRISING MUTUALLY SYNCHRONIZING FIRST AND SECOND ACTIVE FUNCTIONAL UNITS

Carel S. Scholten; Arie Slob, and Pierre G. Jansen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 16, 1982, Ser. No. 358,752
Claims priority, application Netherlands, Apr. 3, 1981, 8101666
Int. Cl.³ H04L *7/02*
U.S. Cl. 375—106 **6 Claims**



1. A synchronization system comprising a first station having a first clock generator, a first signal generator and a first detector; a second station having a second clock generator, a second signal generator and a second detector, said first generator and said second detector being interconnected by a single first interconnecting wire; said second signal generator and said first detector being interconnected by a single second interconnecting wire;

wherein said first signal generator has means for producing under stepwise control by said first clock generator a first stepwise succession of three discrete signal values on said first interconnecting wire from a first extreme signal value to a second extreme signal value and vice versa, two successive discrete signal values being separated by an associated signal transition;

wherein said second signal generator has means for producing under stepwise control by said second clock generator a second stepwise succession of three discrete signal values on said second interconnecting wire from a first extreme signal value to a second extreme signal value of said second signal generator and vice versa, two successive discrete signal values being separated by an associated signal transition;

wherein said second detector has means for detecting a transition to either of said first and second extreme signal values of said first signal generator and thereupon enabling said second signal generator to start a second succession from the prevailing one of said first and second extreme signal values of said second signal generator;

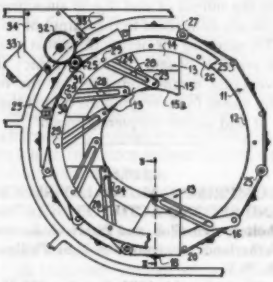
and wherein said first detector has means for detecting a transition to either of the first and second extreme signal values of said second signal generator and thereupon enabling said first signal generator to start a first succession from the prevailing one of first and second extreme signal values of said first signal generator.

4,510,613

DIAPHRAGM FOR DEFINING A RADIATION BEAM

Jean Caugant, and Jacques Dale, both of Paris, France, assignors to Thomson-CSF, Paris, France

Filed Apr. 28, 1983, Ser. No. 489,353
Claims priority, application France, Apr. 30, 1982, 82 07522
Int. Cl.³ A61B *6/00*; G21K *1/04*
U.S. Cl. 378—152 **10 Claims**



1. A diaphragm for defining a beam, particularly an X-ray beam at the input of an image receiver such as an image intensifier, comprising a frame in which there is an opening and a plurality of elements partly overlapping the said opening, wherein the overlap elements consist of flexible material plates and the rear parts thereof extending beyond the outer edge of the frame are turned down, preferably substantially perpendicular to the plane of the said opening.

4,510,614

PREDISTORTED AM STEREO TRANSMISSION

Charles B. Fisher, 2850 Hill Park Rd., Montreal, Quebec H3H 1T1, and Sidney T. Fisher, 53 Morrison Ave., Montreal, Quebec H3R 1K3, both of Canada

Filed Feb. 7, 1984, Ser. No. 577,686
Int. Cl.³ H04H *5/00*
U.S. Cl. 381—16 **1 Claim**

1. The method of generating a compatible AM stereo wave, which comprises:

receiving a first signal and a second signal and forming a first combination of said first and said second signals, and forming a second combination of said first and said second signals, wherein one of said combinations is the sum of said signals, and the other of said combinations is the difference of said signals, and

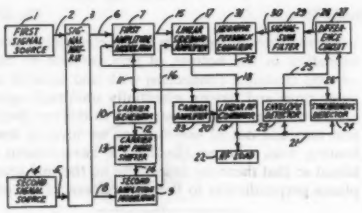
generating a carrier of substantially constant amplitude and substantially constant frequency, and

forming in-phase amplitude-modulation sidebands, of said first combination with predistortion, on said carrier suppressed, and

forming quadrature amplitude-modulation sidebands of said second combination on said carrier shifted 90° and suppressed, and

linearly combining said carrier, said in-phase sidebands, and said quadrature sidebands;

wherein the improvement comprises the predistorting of said first combination, so that said predistortion is substantially equal in amplitude, and substantially opposed in phase, to the distortion of said first combintion due to the presence of said quadrature sidebands, at the output of an envelope detector which receives said carrier, said in-



phase sidebands and said quadrature sidebands, due to delivering said carrier, said distorted in-phase sidebands, and said quadrature sidebands, to an envelope detector, and to a synchronous detector, and

obtaining the difference of the outputs of said said envelope detector and said synchronous detector by a difference circuit, and

passing the output of said difference circuit through a filter with a pass-band substantially the same as the frequency band of said first combination of signals, and

passing the output from said filter through an equalizer which adjusts the phase over a wide range of frequencies in accordance with negative-feedback theory, so as to prevent positive feedback around the negative-feedback loop which includes said filter and said equalizer, and

adding the output of said equalizer to said first combination as said predistortion, and

delivering said carrier, said in-phase sidebands generated by said predistorted first combination of said signals, and said quadrature sidebands generated by said second combination of said signals, to an RF load, as said compatible stereo wave.

4,510,615

MAGNETIC CHARACTER READER WITH DOUBLE DOCUMENT DETECTION

Gene D. Rohrer, Concord, N.C., assignor to International Business Machines Corporation, Armonk, N.Y.

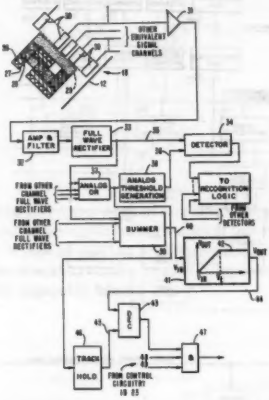
Filed Dec. 29, 1981, Ser. No. 335,482
Int. Cl.³ G06K *9/00, 13/067*; B07C *5/344*
U.S. Cl. 382—7 **10 Claims**

1. Magnetic ink character recognition apparatus including a transport for moving documents bearing magnetic ink characters along a path successively past a character magnetizing station and a read station, said read station comprising a plurality of magnetic sensors arranged to encounter flux from differ-

ent portions of characters borne by documents transported along said path, and wherein the improvement comprises:

first circuit means for producing a reference signal as a function of the output of a small portion of said magnetic sensors,

second circuit means for producing a cumulative signal that



is porportional to the sum of the output of a large portion of said magnetic sensors when said sum is relatively small, and

comparison means responsive to a predetermined relationship between said reference and cumulative signals for indicating a multi-document error condition whenever said predetermined relationship exists.

4,510,616

DESIGN RULE CHECKING USING SERIAL NEIGHBORHOOD PROCESSORS

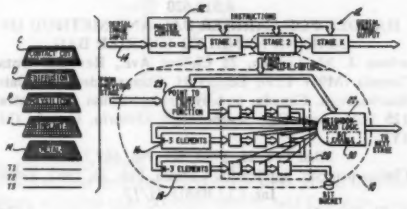
Robert M. Lougheed, and Trevor N. Mudge, both of Ann Arbor, Mich., assignors to The Environmental Research Institute of Michigan, Ann Arbor, Mich.

Division of Ser. No. 340,609, Jan. 19, 1981, Pat. No. 4,441,207. This application Feb. 6, 1984, Ser. No. 577,003

The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

Int. Cl.³ G06K 9/36

U.S. Cl. 382—8 **3 Claims**



1. A method of checking bit-map representations of an article for compliance with preselected geometrical constraints, said method comprising:

feeding said bit-map representations in a raster scan line format to an input of a system having at least one serial neighborhood transformation stage;

performing a series of neighborhood transformations in said system to detect regions in the bit-map not complying with said geometrical constraints; and

generating an output of the system flagging said detected regions in noncompliance.

4,510,617

CHARACTER RECOGNITION SYSTEM UTILIZING PATTERN MATCHING METHOD

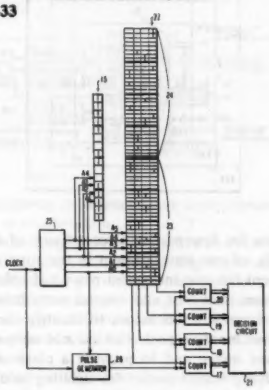
Nobuhiko Mori, Tokyo, Japan, assignor to Nippon Electric Co., Ltd., Tokyo, Japan

Filed Feb. 22, 1982, Ser. No. 351,080

Claims priority, application Japan, Feb. 20, 1981, 56-23966

Int. Cl.³ G06K 9/68

U.S. Cl. 382—33 **5 Claims**



1. A character recognition system for recognizing an input pattern by comparing with a plurality of standard masks, said input pattern being composed of input black and white meshes, each of said standard masks having standard black and white meshes which are to be black and white, respectively, said system comprising:

first memory means for storing said standard masks in the form of standard meshes weighted in plural steps, said first memory means having at least two memory areas, said standard black and white meshes being stored in different memory areas;

means for producing first read out address data;

means for reading out the stored data from said first memory means in response to said first read out address data and input mesh data of said input pattern as second read out address data, the reading out of said standard black and white meshes from said memory areas being selected in response to said input mesh data;

means for counting the read out data from said first memory means.

4,510,618

NOISE CLEANER FOR BINARY IMAGES

Ergin' Ataman, Istanbul, Turkey, and J. Thomas King, Waterloo, Canada, assignors to NCR Canada Ltd - NCR Canada LTEE, Mississauga, Canada

Filed Dec. 27, 1982, Ser. No. 453,561

Int. Cl.³ G06K 9/40

U.S. Cl. 382—54 **10 Claims**

1. Apparatus for removing noise from signals representing a square matrix of binary picture elements comprising:

(a) computing matrix means for providing column sums from the square matrix of binary signals, each having a state corresponding to the color level of a portion of a scanned image;

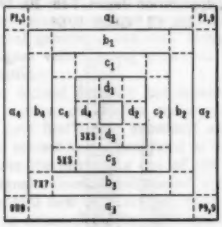
(b) means operatively coupled to said computing matrix means for providing row sums from said binary signals;

(c) modifying matrix means for receiving the matrix of bi-

nary signals from said computing matrix means and for changing the state of the binary signals in select combinations of connected rows and columns in response to a clean signal; and

(d) logic means comprised of:

(i) means for determining a first sum of all the binary signals, of one state, present in the two innermost adjacent rows and columns of the square matrix; and



(ii) means for determining a second sum of all the binary signals, of one state, present in the rows and columns adjacent the two innermost rows and columns and the first sum, said first and second sums being compared against pre-selected values to identify the presence of spurious binary signals that do not correspond to the scanned image and to provide a clean signal to said modifying matrix means for deleting said spurious binary signals from said modifying matrix means.

4,510,619

DOCUMENT PROCESSING SYSTEM

Thomas Q. LeBrun; John Torkelson, both of Dallas; Roy E. Dempster, and Richard G. Van Tyne, both of Richardson, all of Tex., assignors to BancTec, Incorporated, Dallas, Tex.

Filed Oct. 1, 1981, Ser. No. 307,809

Int. Cl.³ G06K *9/00*

U.S. Cl. 382—57 **1 Claim**

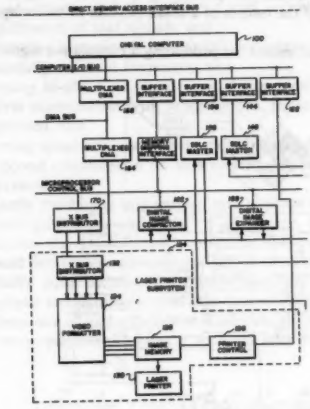
1. Apparatus for processing documents, comprising:

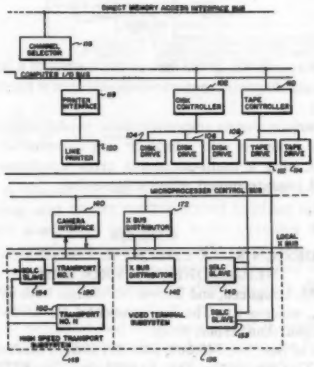
(a) transport means for continuously transporting said documents along a transport path;

(b) encoding means disposed adjacent said transport path for selectively encoding machine readable data upon said documents, said encoding means comprising a plurality of fixed dies, a plurality of electronically controlled hammers, and a magnetic ink bearing ribbon interposed between said documents and said dies and being transported at the same velocity as the velocity of transport of said documents;

(c) reader means disposed adjacent said transport path for reading machine readable data on said documents while said documents are transported, without interruption, past said reader means; and

(d) image capture means disposed adjacent said transport path for capturing and digitizing an image of at least a portion of said documents, said image capture means comprising means for vertically scanning said documents, means for horizontally analyzing consecutive vertical scans to identify black and white sections as well as repeti-





tive patterns of said image, and means for generating distinctive codes representative of said analyzing.

4,510,620

HANDLE FOR CARRIER BAG AND METHOD OF MAKING HANDLED CARRIER BAG

Marinus J. M. Langen, 21 Chilcot Ave., Rexdale, Ontario, Canada (M9W 1T9); Edgars H. Strauss, deceased, late of Scarborough, Canada, and by Leida Strauss, administrator, 125 Hildenboro Sq., Scarborough, Ontario, Canada (M1W 1Y2)

Filed Feb. 25, 1983, Ser. No. 469,748

Claims priority, application Canada, Feb. 23, 1982, 396889

Int. Cl.³ B65D *33/12*

U.S. Cl. 383—14 **3 Claims**

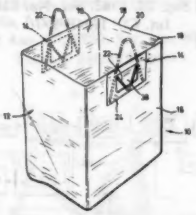
1. In a carrier bag which has a container portion having a pair of oppositely disposed side walls each having an upper edge; the improvement of;

a handle comprising;

(a) an elongated band of flexible material having a high tensile strength, said elongated band being initially arranged in an M-shaped configuration having a pair of outer leg portions and a V-shaped bridge portion which extends therebetween,

(b) a mounting panel having a mounting face secured to said outer leg portions and to the lower end of the V-shaped

bridge portion, said mounting panel also being secured to one of said side walls in a position in which it initially retains the elongated band in its M-shaped configuration and in which the M-shaped configuration extends downwardly from said upper edge of said side wall, said mounting panel being severable on both sides of lower end of the V-shaped bridge portion to release the bridge portion to permit it to extend upwardly from said upper edge to form a manually engagable handle.

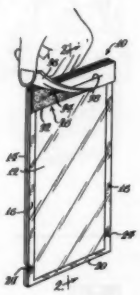


4,510,621

SELF-SEALING POUCH FOR FORMING ADHESIVE-TO-ADHESIVE SEAL

Dennis A. Sak, Hinsdale, and Thomas Mestetsky, St. Charles, both of Ill., assignors to Arvey Corporation, Chicago, Ill.

Filed Jun. 30, 1983, Ser. No. 509,396
Int. Cl.³ B65D *33/20, 77/12*
U.S. Cl. 383—89 **17 Claims**



1. A self-sealing pouch, comprising:

first and second generally coextensive webs joined together along marginal edge portions thereof, said first web comprising plastic film material;

an elongated access opening defined by said first web generally adjacent one end thereof for providing access to the interior of said pouch, said access opening extending generally transversely of said pouch; and

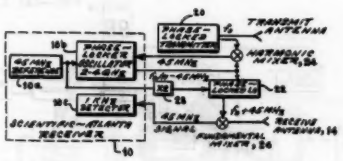
pressure-sensitive adhesive sealing means provided on said first web on opposite sides of said access opening so that said opening can be sealed by folding said pouch to bring said adhesive means into confronting relation with itself to form an adhesive-to-adhesive seal for closing said access opening.

4,510,622

HIGH SENSITIVITY MILLIMETER-WAVE MEASUREMENT APPARATUS

Tsutomu T. Mori, Gardena; Robert B. Dybdal, Palos Verdes Estates, both of Calif., and Robert D. Etcheverry, Hawthorne, Calif. (by Nancy Etcheverry, guardian), assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jun. 14, 1982, Ser. No. 388,327
Int. Cl.³ H04B *17/00*
U.S. Cl. 455—67 **4 Claims**



1. A high sensitivity millimeter wave measurement apparatus comprising in combination:

means for transmitting a millimeter wave at a predetermined operating frequency, said transmitting means including a crystal oscillator to provide a phase-locked transmitter, said transmitting means providing a transmitter signal;

means for receiving a millimeter wave, said receiving means including a phase-locked local oscillator and a fundamental mixer unit;

a harmonic mixer unit operatively connected to said phase-locked transmitter to sample transmitter frequency deviations; and,

a microwave receiver unit operatively connected to said harmonic mixer unit to receive said transmitter frequency deviations, said microwave receiver unit including a phase-locked oscillator to track said transmitter frequency deviations, said phase-locked oscillator providing a reference signal to both said harmonic mixer unit and said phase-locked local oscillator of said receiving means, said microwave receiver unit generating an internal 45 MHz reference signal, said 45 MHz reference signal being applied to said phase-locked oscillator in said microwave receiver unit, said 45 MHz reference signal being doubled by a times 2 multiplier unit and applied as a reference signal to said phase-locked local oscillator in said receiving means, said phase-locked local oscillator providing a local oscillator signal to said fundamental mixer unit, said receiving means receiving and applying said millimeter wave to said fundamental mixer unit, said fundamental mixer unit mixing said local oscillator signal and said said millimeter wave to provide a first IF signal to said microwave receiver unit for detection and measurement.

4,510,623

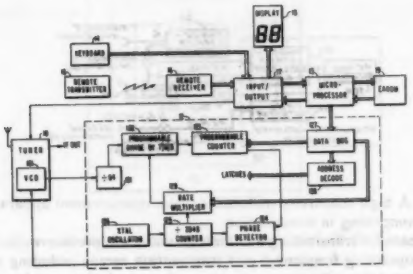
TELEVISION CHANNEL LOCKOUT

Paul Bonneau, Portsmouth; Howard E. Holshouser, Suffolk, and Terrence E. Rogers, Portsmouth, all of Va., assignors to General Electric Company, Portsmouth, Va.

Filed Jul. 23, 1982, Ser. No. 401,175
Int. Cl.³ H04B *1/16;* **H04N** *5/44, 7/16*
U.S. Cl. 455—181 **23 Claims**

1. A receiver of the type which is electronically tunable to any of a plurality of modulated carrier signals, said receiver comprising a tuner local oscillator the oscillating frequency of which is controlled by a phase lock loop having a programmable frequency divider, a microprocessor responsive to an input indicating the selection of a modulated carrier signal to which the receiver should tune for loading said programmable frequency divider with a programmable constant to cause said local oscillator to oscillate at the required frequency to tune the receiver to the selected modulated carrier signal, and a

non-volatile memory connected to said microprocessor for storing information, said microprocessor being responsive to a user entered lockout code sequence for storing in said non-volatile memory information identifying at least one of said plurality of modulated carrier signals the reception of which is to be inhibited and also for storing in said non-volatile memory said user entered lockout code sequence, timing means, said



microprocessor being responsive to said timing means to thereafter for a predetermined period of time prohibiting the loading of a corresponding programmable constant in said programmable frequency divider whenever a user input indicates the selection of a modulated carrier signal the reception of which is to be inhibited and when said predetermined period of time has expired, said micrprocessor erasing the information in said non-volatile memory.

4,510,624

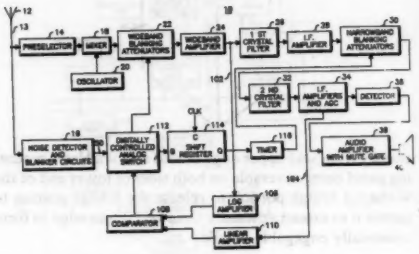
NOISE BLANKING ARRANGEMENT TO MINIMIZE BLANKER SPLATTER

Sharon E. Thompson, Rolling Meadows, and Bruce C. Eastmond, Downers Grove, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Sep. 22, 1983, Ser. No. 535,001

Int. Cl.³ H04B 1/10

U.S. Cl. 455—223 **26 Claims**



1. An impulse noise blanking control arrangement for use in a radio receiver having a wideband, prefilter stage, a narrowband, postfilter stage and a filter coupled in between said wideband and narrowband stages, said control arrangement comprising:

a. means for sensing the signal level in the wideband stage and providing a corresponding first output signal;

b. means for sensing the signal level in the narrowband stage and providing a corresponding second output signal;

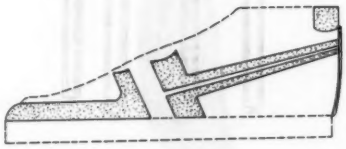
c. means for comparing said first and said second output signals and producing a control signal; and

d. means for selectively blanking impulse noise in either the wideband, prefilter stage or narrowband postfilter stage in response to said control signal.

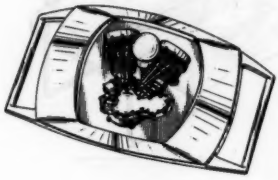
278,279
THIGH PROTECTOR
Eugene J. Vacanti, Edina, Minn., assignor to Sports Marketing, Inc., Minneapolis, Minn.
Filed Aug. 17, 1982, Ser. No. 408,855
Term of patent 14 years
U.S. Cl. D2—27

278,280
CHEST AND SHOULDER PROTECTOR
John R. Gregory, 303 W. 35th St., Ste. C, National City, Calif. 92050; Gerald R. Parks, Denver, Colo., and John D. Dondero, Sun Valley, Id., assignors to John R. Gregory, National City, Calif.
Filed Mar. 10, 1983, Ser. No. 474,053
Term of patent 14 years
U.S. Cl. D2—27

278,281
STRIPES PORTION OF AN ATHLETIC SHOE
Stanley A. Dreir, and Jeffrey Dreir, both of 58 Independence Dr., East Brunswick, N.J. 08816
Filed Aug. 23, 1982, Ser. No. 410,347
Term of patent 14 years
U.S. Cl. D2—314



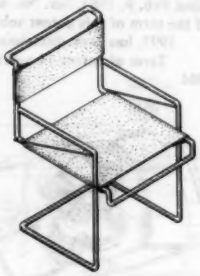
278,282
PANHEAD ENGINE BELT BUCKLE
Thomas H. Rudd, Wayzata, Minn., assignor to Drag Specialties, Inc., Minnetonka, Minn.
Filed Feb. 9, 1983, Ser. No. 465,300
The portion of the term of this patent subsequent to Sep. 27, 1997, has been disclaimed.
Term of patent 14 years
U.S. Cl. D2—394



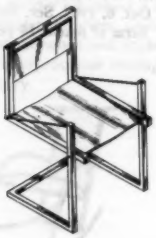
278,283
ROCKING CHAIR
Carlos Riart, Palma De Mallorca, Spain, assignor to Knoll International, Inc., New York, N.Y.
Filed Oct. 6, 1982, Ser. No. 433,164
Term of patent 14 years
U.S. Cl. D6—348

278,284
SPOOL AND SPINDLE ROCKING CHAIR
Michael W. Bowen, 1847 Parr Hwy., Adrian, Mich. 49221
Filed Nov. 17, 1982, Ser. No. 442,311
Term of patent 14 years
U.S. Cl. D6—348

278,285
CHAIR
Charles Lowrey, 770 Park Ave, New York, N.Y. 10021
Filed Jan. 11, 1983, Ser. No. 457,238
Term of patent 14 years
U.S. Cl. D6—372

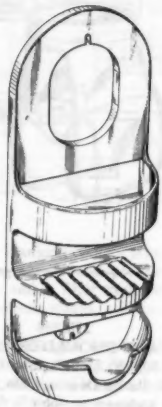


278,286
CHAIR
Charles Lowrey, 770 Park Ave., New York, N.Y. 10021
Filed Jan. 11, 1983, Ser. No. 457,239
Term of patent 14 years
U.S. Cl. D6—372

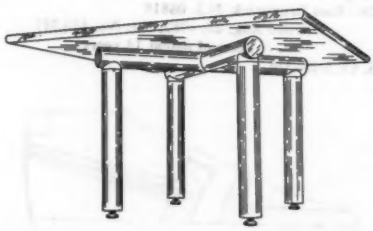


278,287
SEAT
Gianbattista Giudici, Seveso, Italy, assignor to Altena Salotti, s.r.l., Cabiate, Italy
Filed Sep. 3, 1982, Ser. No. 414,686
Claims priority, application Italy, Mar. 9, 1982, 21084/82[U]
Term of patent 14 years
U.S. Cl. D6—381

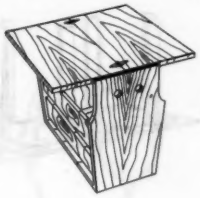
278,288
SHOWER CADDY
Giovanna Talocci, and Fabio Lenci, both of Rome, Italy, assignors to F. LLI Guzzini S.p.A., Recanati, Italy
Filed Jan. 19, 1982, Ser. No. 340,633
Claims priority, application Italy, Jul. 24, 1981, 22460/81[U]
Term of patent 14 years
U.S. Cl. D6—525



278,289
TABLE
Ettore Sottsass, and Michele De Lucchi, both of Milan, Italy, assignors to Olivetti Synthesis, S.p.A., Ivrea, Italy
Filed Jan. 10, 1983, Ser. No. 456,771
Claims priority, application Italy, Jul. 8, 1982, 53486/82[U]
Term of patent 14 years
U.S. Cl. D6—487



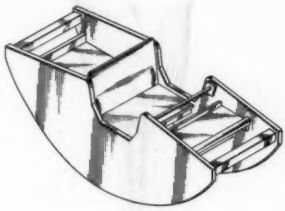
278,290
EXTENDIBLE TABLE
Marvin H. Morton, Jr., Rte. 1, Box E, Albemarle, N.C. 28001
Filed Jun. 30, 1982, Ser. No. 393,689
Term of patent 14 years
U.S. Cl. D6—430



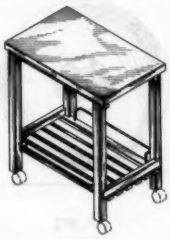
278,291
CLOTHING HANGER SUPPORT
Jack L. Gurule, 1250 Adams #D-101, Costa Mesa, Calif. 92626
Filed Oct. 13, 1983, Ser. No. 541,773
Term of patent 14 years
U.S. Cl. D6—328

278,292
HAMMOCK
James T. Newby, 2624 Belle Meade Dr., Huntsville, Ala. 35811
Filed Jul. 9, 1982, Ser. No. 396,791
Term of patent 14 years
U.S. Cl. D6—347

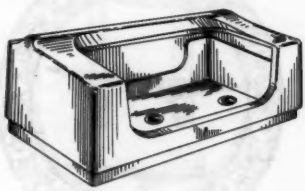
278,293
ROCKER
Mark J. Strang, 1209 Sonoma, Carson City, Nev. 89701
Filed Mar. 15, 1983, Ser. No. 475,616
Term of patent 14 years
U.S. Cl. D6—348



278,294
TABLE
John J. Dau, P.O. Box 188, Bally, Pa. 19503
Filed Mar. 4, 1983, Ser. No. 472,177
Term of patent 14 years
U.S. Cl. D6—477



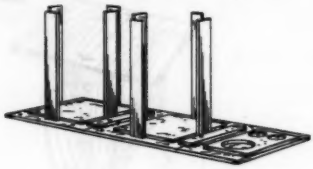
278,295
TISSUE BOX HOLDER
Bruce R. Thompson, 32 Shakespeare Ave., Tranmere, South Australia, Australia
Filed Nov. 1, 1982, Ser. No. 438,050
Claims priority, application Australia, May 5, 1982, 302/82
Term of patent 14 years
U.S. Cl. D6—518

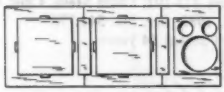


278,296
WINE GLASS
Ben Seibel, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Jul. 29, 1982, Ser. No. 402,946
Term of patent 14 years
U.S. Cl. D7—13

278,297
PLATE OR THE LIKE
Ming-Ter Chen, 1232-1236 E. Factory Pl., Los Angeles, Calif. 90013
Filed Jun. 13, 1983, Ser. No. 492,886
Term of patent 14 years
U.S. Cl. D7—24

278,298
COMBINED HOLDER FOR SLICED BREAD AND CONDIMENT CONTAINERS OR THE LIKE
Eldor N. Schuman, 9633 10th Ave., Carney, Md. 21234
Filed Apr. 29, 1982, Ser. No. 373,210
Term of patent 14 years
U.S. Cl. D7—52





278,299
FORK
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Sep. 15, 1982, Ser. No. 418,467
Term of patent 14 years
U.S. Cl. D7—151

278,300
SPOON
Larry R. Laslo, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Sep. 15, 1982, Ser. No. 418,470
Term of patent 14 years
U.S. Cl. D7—151

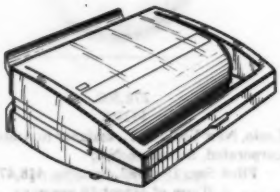
278,301
KNIFE
Larry R. Laslo, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Sep. 15, 1982, Ser. No. 418,472
Term of patent 14 years
U.S. Cl. D7—151

278,302
KNIFE
Larry R. Laslo, New York, N.Y., assignor to American Commercial Incorporated, Secaucus, N.J.
Filed Sep. 15, 1982, Ser. No. 418,474
Term of patent 14 years
U.S. Cl. D7—151

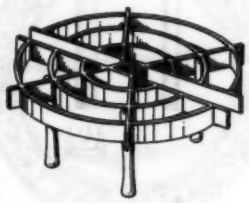
278,303
FORK
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Sep. 15, 1982, Ser. No. 418,479
Term of patent 14 years
U.S. Cl. D7—151

278,304
SPOON
Larry R. Laslo, New York, N.Y., assignor to American Commercial, Incorporated, Secaucus, N.J.
Filed Sep. 15, 1982, Ser. No. 418,487
Term of patent 14 years
U.S. Cl. D7—151

278,305
WAFFLE MAKER
Alfred W. Madl, Glendale, and Charles J. Kirschling, Whitefish Bay, both of Wis., assignors to Sunbeam Corporation, Oak Brook, Ill.
Filed Jan. 13, 1983, Ser. No. 457,798
Term of patent 14 years
U.S. Cl. D7—352



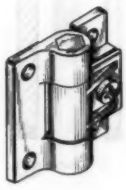
278,306
MICROWAVE OVEN RACK
Lois A. McIntosh, P.O. Box 1842, Calgary, Alberta, Canada T2G 4X3
Filed Dec. 19, 1980, Ser. No. 218,036
Claims priority, application Canada, Jun. 30, 1980, 30-06-80-1
Term of patent 14 years
U.S. Cl. D7—409



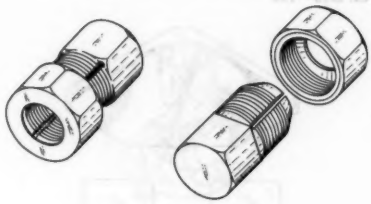
278,307
COMBINED CAN OPENER AND SHOT MEASURER
Richard W. Birchenall, P.O. Box 24847 Way, San Jose, Calif. 95154
Filed Dec. 27, 1982, Ser. No. 453,504
Term of patent 14 years
U.S. Cl. D8—34

278,308
MULTIPLE HOLD-DOWN CLAMP
Victor P. Garvis, 2315 12th St. Pl., Moline, Ill. 61265
Filed Aug. 2, 1982, Ser. No. 404,187
Term of patent 14 years
U.S. Cl. D8—73

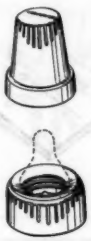
278,309
HINGE
James H. Vickers, Middletown, Pa., assignor to Southco. Inc., Concordville, Pa.
Filed Jul. 13, 1983, Ser. No. 513,370
Term of patent 14 years
U.S. Cl. D8—327



278,310
STUD BOLT WRENCH
Dennis M. Allen, 3850 Hiawatha Way, San Diego, Calif. 92117
Filed Apr. 28, 1982, Ser. No. 372,627
Term of patent 14 years
U.S. Cl. D8—21



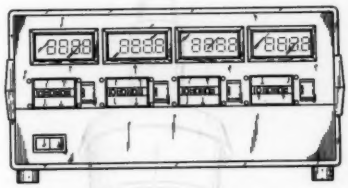
278,311
COMBINED HOOD AND COLLAR
John M. Brown; Donald Herritz, both of Reedsburg, Wis.; Barbara L. Ottinger, Newaygo, Mich., and Leland D. Westmas, Reedsburg, Wis., assignors to Gerber Products Company, Fremont, Mich.
Filed Sep. 28, 1982, Ser. No. 426,037
Term of patent 14 years
U.S. Cl. D9—436



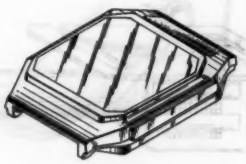
278,312
DISPENSING CLOSURE
Bruce T. Cleevely, and Robert A. Adam, both of Pittsburgh, Pa., assignors to General Foods Corporation, White Plains, N.Y.
Filed Mar. 11, 1983, Ser. No. 474,400
Term of patent 14 years
U.S. Cl. D9—449

278,313
CLOCK
Maurice Progin, ch. de la Vauchère 20, P.O. Box 42, 1000 Lausanne 5, Switzerland
Filed Oct. 22, 1982, Ser. No. 436,080
Claims priority, application Hague, Apr. 26, 1982, 72330
Term of patent 14 years
U.S. Cl. D10—23

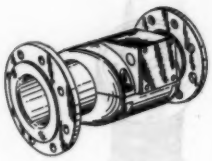
278,314
SURGICAL TEMPERATURE MONITOR AND ALARM SYSTEM
Allen L. Van Beek, Minneapolis, and Alfred L. Iversen, Minnetonka, both of Minn., assignors to PMT Inc., Hopkins, Minn.
Filed Sep. 16, 1982, Ser. No. 418,805
Term of patent 14 years
U.S. Cl. D10—53



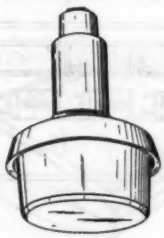
278,315
WATCH CASE
John T. Houlihan, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.
Filed Mar. 30, 1983, Ser. No. 480,629
Term of patent 14 years
U.S. Cl. D10—30



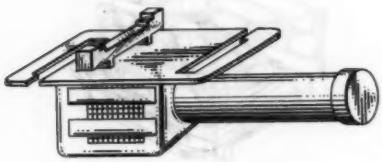
278,316
FLOWMETER FLOW TUBE
Darroll D. Bengtson, New Brighton, Minn., assignor to Rosemount Inc., Eden Prairie, Minn.
Filed Jul. 26, 1982, Ser. No. 401,889
Term of patent 14 years
U.S. Cl. D10—96



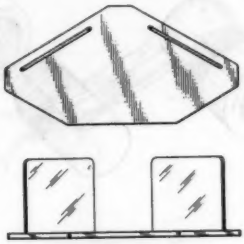
278,317
SUPERSONIC TRANSCEIVER LEVEL MEASURE DEVICE
Roland E. Jelvestam, Björnidegränd 29, S-162 46 Vällingby, Sweden
Filed Nov. 30, 1982, Ser. No. 445,719
Claims priority, application Sweden, Jun. 28, 1982, 82-1713
Term of patent 14 years
U.S. Cl. D10—101



278,318
PURSE ALARM
William Levin, 166 Nelson Rd., Scarsdale, N.Y. 10583, and Kenneth Skyer, 2 Edgewood Dr., Goshen, N.Y. 10924
Filed May 18, 1983, Ser. No. 495,746
Term of patent 14 years
U.S. Cl. D10—106



278,319
REFLECTOR FOR DASH MOUNTED VEHICLE EMERGENCY FLASHING LIGHT OR THE LIKE
Stephen Crane, Penfield, and Douglas A. Crane, Fairport, both of N.Y., assignors to Crane Manufacturing and Plastics Corp., Fairport, N.Y.
Filed Oct. 15, 1982, Ser. No. 434,706
Term of patent 14 years
U.S. Cl. D10—114

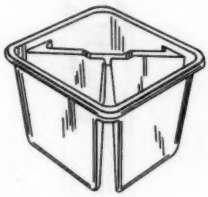


278,320
RELIGIOUS MEDAL
Eugene H. Primoff, 15 Whitfield Ter., New Rochelle, N.Y. 10801
Filed Sep. 20, 1982, Ser. No. 420,400
Term of patent 14 years
U.S. Cl. D11—96

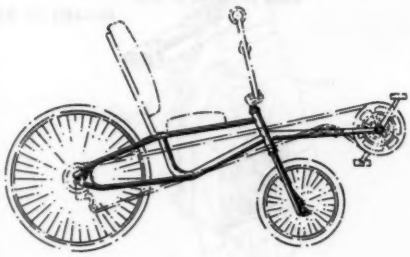
278,321
ZODIACAL CUSP MEDALLION
Patricia A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Division of Ser. No. 58,730, Jul. 17, 1979, Pat. No. 263,384. This application Mar. 24, 1981, Ser. No. 247,130
Term of patent 14 years
U.S. Cl. D11—100

278,322
ZODIACAL CUSP MEDALLION
Patricia A. Martignette, 212 Cottage Blvd., Hicksville, N.Y. 11801
Division of Ser. No. 58,730, Jul. 17, 1979, Pat. No. 263,384. This application Mar. 24, 1981, Ser. No. 247,110
Term of patent 14 years
U.S. Cl. D11—105

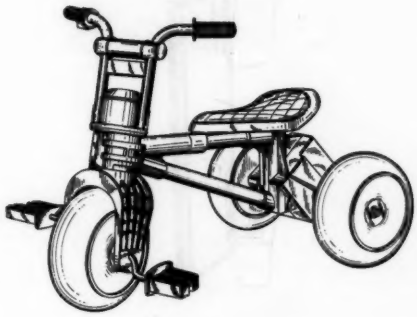
278,323
SEGMENTED PLANT CONTAINER
Fred N. Blackmore, Jr., 4300 Braun, Saline, Mich. 48176
Filed Mar. 10, 1983, Ser. No. 473,901
Term of patent 14 years
U.S. Cl. D11—155



278,324
BICYCLE FRAME
John D. Breen, Antioch, Tenn., assignor to The Murray Ohio Manufacturing Co., Brentwood, Tenn.
Filed Apr. 5, 1982, Ser. No. 365,865
Term of patent 14 years
U.S. Cl. D12—111



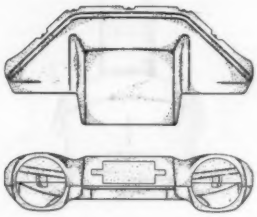
278,325
TRICYCLE
Dietmar Nagel, Chester, N.J., assignor to Nagel/Kennedy/Arad & Associates, New York, N.Y.
Filed Jul. 27, 1983, Ser. No. 517,663
Term of patent 14 years
U.S. Cl. D12—112



278,326
EXPANSION CHAMBER
John E. Equi, 3116 Acklen Dr., Huntsville, Ala. 35805
Filed Oct. 11, 1983, Ser. No. 540,542
Term of patent 14 years
U.S. Cl. D12—194

278,327
RADIO MOUNTING FAIRING FOR A MOTORCYCLE FAIRING
William E. Willis, 13362 Jessica Dr., Garden Grove, Calif. 92643
Filed Mar. 3, 1982, Ser. No. 354,366
Term of patent 14 years
U.S. Cl. D12—114

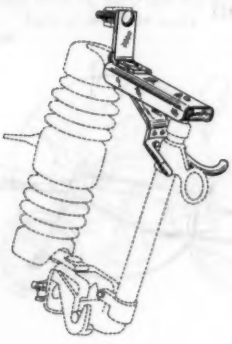
278,328
MOTORCYCLE RADIO HOUSING
Fred O. Hoese, 30706 Wildcat Dr., Bulverde, Tex. 78163
Filed May 26, 1982, Ser. No. 382,188
Term of patent 14 years
U.S. Cl. D12—114



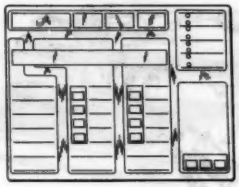
278,329
MOTOR VEHICLE RUNNING BOARD
Dennis O. Baker, Sherman Township, St. Joseph County, and James E. Anderson, Sturgis, both of Mich., assignors to Owens-Classic, Inc., Sturgis, Mich.
Filed Jan. 14, 1983, Ser. No. 458,092
Term of patent 14 years
U.S. Cl. D12—203

278,330
PRINTED CIRCUIT BOARD STANDOFF
Royce W. Hill, Flippin, Ark., assignor to Micro Plastics Inc., Flippin, Ark.
Filed Sep. 13, 1982, Ser. No. 416,867
Term of patent 14 years
U.S. Cl. D13—24

278,331
SHIELD AND FUSE CONTACT ASSEMBLY FOR ELECTRICAL CUTOUT
Delmar E. McNaghten; Dennis C. Kent, and Robert A. Brown, all of Centralia, Mo., assignors to A. B. Chance Company, Centralia, Mo.
Filed Apr. 30, 1982, Ser. No. 373,748
Term of patent 14 years
U.S. Cl. D13—35

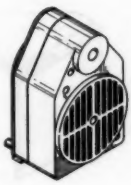


278,332
TERMINAL FOR DETECTING, SIGNALING AND EVALUATING VARIOUS HAZARD CRITERIA, SUCH AS FIRE OR INTRUSION CONDITIONS
Otto Meier, Hombrechtikon, and Felix Huber, Meilen, both of Switzerland, assignors to Cerberus A.G., Mannedorf, Switzerland
Filed Sep. 29, 1982, Ser. No. 427,135
Term of patent 14 years
U.S. Cl. D13—35



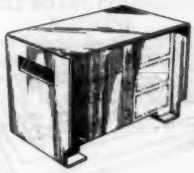
278,333
MICROPHONE
Kazuaki Takata, Hachioji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Feb. 28, 1983, Ser. No. 470,469
Claims priority, application Japan, Sep. 6, 1982, 57-40638
Term of patent 14 years
U.S. Cl. D14—12

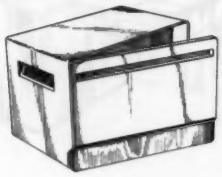
278,334
ELECTRIC MOTOR DRIVEN PHONOGRAPH FOR INTERNAL PLACEMENT IN TOYS OR THE LIKE
Katsumi Watanabe, deceased, late of Kawasaki, Japan (by Shizuko Watanabe, legal heir), assignor to Ozen Corporation, Tokyo, Japan
Filed Aug. 27, 1981, Ser. No. 296,918
Claims priority, application Japan, May 12, 1981, 56-20110
Term of patent 14 years
U.S. Cl. D14—14



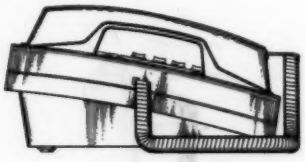
278,335
LOUDSPEAKER FRONT PANEL ASSEMBLY
Hari Matsuda, Evanston; Anthony J. Cascarano, Lake Forest, and Charles M. Schwimmer, Chicago, all of Ill., assignors to International Jensen Incorporated, Schiller Park, Ill.
Filed Jun. 2, 1982, Ser. No. 384,399
Term of patent 14 years
U.S. Cl. D14—39

278,336
COMMUNICATION APPARATUS ENCLOSURE
Joseph Girardi, Edison, N.J., and Gordon E. Sylvester, Jamaica, N.Y., assignors to AT&T Bell Laboratories, Murray Hill, N.J.
Filed Sep. 15, 1982, Ser. No. 418,204
Term of patent 14 years
U.S. Cl. D14—52

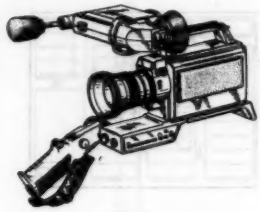




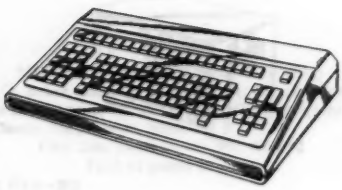
278,337
TELEPHONE
Ronald C. Banko, North Wales, Pa., assignor to Comdial Telephone Systems, Inc., Charlottesville, Va.
Filed Jan. 27, 1983, Ser. No. 461,574
Term of patent 14 years
U.S. Cl. D14—58



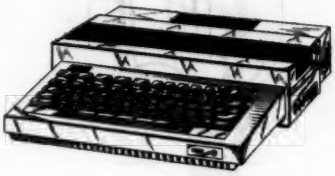
278,338
CAMERA FOR VIDEO TAPE RECORDER
Koya Kurokawa, and Noriyuki Arai, both of Ehime, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Sep. 29, 1982, Ser. No. 428,516
Claims priority, application Japan, Apr. 1, 1982, 57-13981; Apr. 1, 1982, 57-13982
Term of patent 14 years
U.S. Cl. D14—78



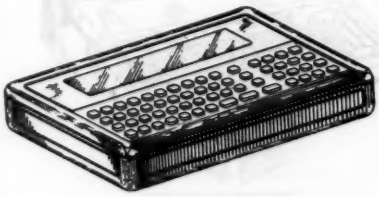
278,339
KEYBOARD FOR A DATA TERMINAL
Terence T. Caven, Beeston, England, assignor to Plessey Overseas Limited, Ilford, England
Filed Apr. 28, 1982, Ser. No. 372,710
Claims priority, application United Kingdom, Oct. 28, 1981, 1063268
Term of patent 14 years
U.S. Cl. D14—100



278,340
COMPUTER
Haruyuki Enomoto, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Aug. 24, 1982, Ser. No. 410,990
Claims priority, application Japan, Mar. 2, 1982, 57-8518
Term of patent 14 years
U.S. Cl. D14—100



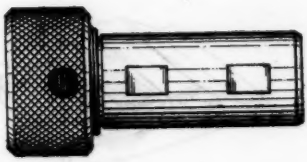
278,341
PORTABLE TERMINAL OR SIMILAR ARTICLE
William J. Scheid, Coral Springs, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Jan. 19, 1983, Ser. No. 459,162
Term of patent 14 years
U.S. Cl. D14—100



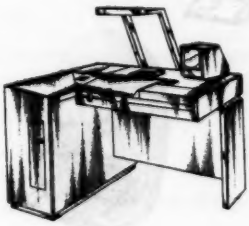
278,342
REFRIGERATOR CABINET
Erling Damkjaer, Esbjerg, Denmark, assignor to A/S Vestfrost, Esbjerg, Denmark
Filed Dec. 9, 1982, Ser. No. 448,510
Claims priority, application Denmark, Feb. 7, 1982, 634/82
Term of patent 14 years
U.S. Cl. D15—88

278,343
GAUGE BAR
Gerald V. Roch, Marion County, Ind., assignor to Hurco Manufacturing Co., Inc., Indianapolis, Ind.
Filed Jul. 30, 1982, Ser. No. 403,467
Term of patent 14 years
U.S. Cl. D15—123

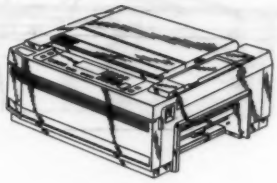
278,344
COLLET HOLDER
Roger R. Smith, Erin, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.
Filed Mar. 9, 1982, Ser. No. 356,413
Term of patent 14 years
U.S. Cl. D15—140



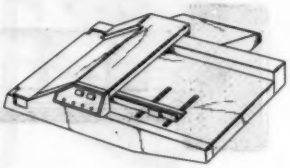
278,345
PRINTED CIRCUIT BOARD COMPONENT MOUNTING MACHINE
F. Scott Gordon, San Gabriel; Derek H. Fender, Altadena, both of Calif., and Michael J. Dolan, New York, N.Y., assignors to CAPS Industries, San Marino, Calif.
Filed Dec. 17, 1982, Ser. No. 450,681
Term of patent 14 years
U.S. Cl. D15—199



278,346
ELECTROSTATIC COPIER
Yasuhiro Saito, Tokyo; Tetsuya Goto, and Toshio Umino, both of Kanagawa, all of Japan, assignors to Ricoh Company, Ltd., Japan
Filed Aug. 25, 1982, Ser. No. 413,222
Claims priority, application Japan, Feb. 25, 1982, 57-7802
Term of patent 14 years
U.S. Cl. D16—31



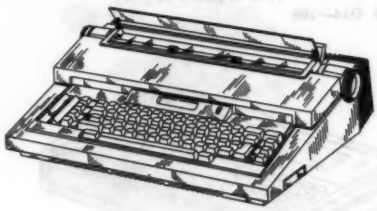
278,347
AUTOMATIC ORIGINAL FEED FOR COPYING APPARATUS
Hideyuki Kawazu, Hachioji, Japan, assignor to Olympus Optical Company, Ltd., Tokyo, Japan
Filed Jun. 21, 1982, Ser. No. 390,341
Claims priority, application Japan, Jan. 12, 1982, 57-690
Term of patent 14 years
U.S. Cl. D16—32



278,348
MAGNIFIER VIEWING UNIT
Robert H. R. Horgan, West Beach, Australia, assignor to Horgan Investments Pty. Ltd., Medindie, Australia
Filed Nov. 14, 1983, Ser. No. 551,177
Term of patent 14 years
U.S. Cl. D16—135

278,349
GUITAR BODY OR SIMILAR ARTICLE
Hartley D. Peavey, and Michael V. Powers, both of Meridian, Miss., assignors to Peavey Electronics Corp., Meridian, Miss.
Filed Jun. 22, 1982, Ser. No. 390,826
Term of patent 14 years
U.S. Cl. D17—20

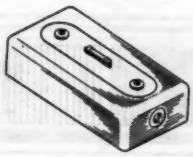
278,350
ELECTRONIC TYPEWRITER
Mario Bellini, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea, Italy
Filed Sep. 8, 1982, Ser. No. 416,019
Claims priority, application Italy, Mar. 8, 1982, 5301082[U]
Term of patent 14 years
U.S. Cl. D18—1



278,351
TYPEWRITER
Toshiaki Funato; Masayuki Morishita, and Masafumi Itoh, all of Nagoya, Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Jul. 6, 1983, Ser. No. 511,339
Claims priority, application Japan, Jan. 11, 1983, 58-504
Term of patent 14 years
U.S. Cl. D18—1

278,352
DIARY
Roger A. Wenstrom; William W. Holes, and Leon C. Raiter, all of St. Cloud, Minn., assignors to The Holes-Webway Company, St. Cloud, Minn.
Filed Aug. 9, 1982, Ser. No. 406,388
Term of patent 14 years
U.S. Cl. D19—26

278,353
BLOCK FOR ELECTRICAL CIRCUITRY ASSEMBLY KITS
Yechiel Salit, 12 Alexander Yanai St., Tel Aviv, Israel
Filed Aug. 30, 1982, Ser. No. 412,937
Term of patent 14 years
U.S. Cl. D19—62



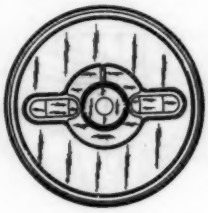
278,354
RACK FOR HANGING SOFT COVER BOOKS
John E. Mahowald, 1401 Klepper Ave., Kingsburg, Calif. 93631
Filed Jul. 18, 1983, Ser. No. 514,560
Term of patent 14 years
U.S. Cl. D19—91

278,355
SIGN FRAME
Kenneth L. Williams, SRA Box 489, Anchorage, Ak. 99507
Filed Nov. 22, 1982, Ser. No. 443,188
Term of patent 14 years
U.S. Cl. D20—38

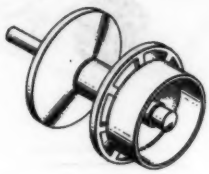
278,356
TIRE FOR TOY VEHICLE
Adolph E. Goldfarb, 1432 SE. Wind Cir., Westlake Village, Calif. 91361, and Delmar K. Everitt, Woodland Hills, Calif., assignors to Adolph E. Goldfarb, Westlake Village, Calif.
Filed Dec. 20, 1982, Ser. No. 451,105
Term of patent 14 years
U.S. Cl. D21—141

278,357
FACIAL APPLIANCE FOR MAKEUP
Barry R. Koper, 7647 Lemp Ave., North Hollywood, Calif. 91605
Division of Ser. No. 370,209, Apr. 21, 1982, which is a continuation-in-part of Ser. No. 161,014, Jun. 19, 1980, which is a continuation-in-part of Ser. No. 46,229, Jun. 7, 1979. This application Jun. 29, 1984, Ser. No. 626,641
Term of patent 14 years
U.S. Cl. D21—190

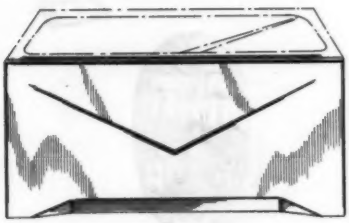
278,358
BARBELL WEIGHT
Brian R. Zwilling, Longmeadow, Mass., assignor to Spalding & Evenflo Company, Inc., Tampa, Fla.
Filed Jun. 1, 1983, Ser. No. 499,948
Term of patent 14 years
U.S. Cl. D21—196



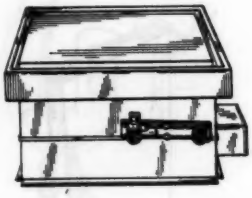
278,359
FISHING REEL SPOOL
Tatsuo Sugimoto, Tokyo, Japan, assignor to Daiwa Seiko, Inc., Tokyo, Japan
Division of Ser. No. 402,735, Jul. 28, 1982, Pat. No. Des. 247,832. This application Mar. 2, 1984, Ser. No. 585,505
Claims priority, application Japan, Feb. 25, 1982, 57-7844; Feb. 25, 1982, 57-7845
Term of patent 14 years
U.S. Cl. D22—25



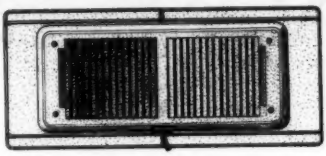
278,360
BATHTUB APRON
Herbert V. Kohler, Jr., Kohler, and Donald W. Doman, Janesville, both of Wis., assignors to Kohler Co., Kohler, Wis.
Filed Jan. 17, 1983, Ser. No. 458,629
Term of patent 14 years
U.S. Cl. D23—55



278,361
HEAT EXCHANGER
Richard J. Pernosky, 1121 Contempo Ct., Ontario, Calif. 91761
Filed Sep. 2, 1982, Ser. No. 414,491
Term of patent 14 years
U.S. Cl. D23—136

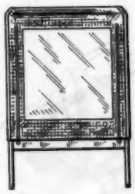


278,362
REGISTER FAN
Thomas Rattray, Cincinnati, Ohio, assignor to Con-Serv Incorporated, Cincinnati, Ohio
Filed Jun. 17, 1982, Ser. No. 389,244
Term of patent 14 years
U.S. Cl. D23—155

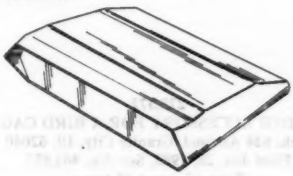


278,363
BANDAGE
Lotte Schenkel, Basel, and Peter Fankhauser, Ettingen, both of Switzerland, assignors to ALZA Corporation, Palo Alto, Calif.
Filed Mar. 9, 1982, Ser. No. 356,261
Term of patent 14 years
U.S. Cl. D24—49

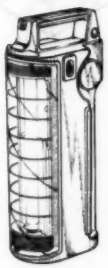
278,364
GREENHOUSE
Sigvard G. Karlsson, Korpralsgatan 9, S-371 41 Karlskrona, Sweden
Filed Apr. 22, 1982, Ser. No. 370,969
Claims priority, application Sweden, Oct. 12, 1981, 81-2281
Term of patent 14 years
U.S. Cl. D25—15



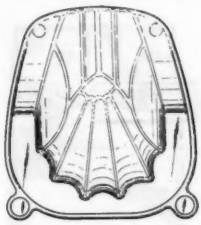
278,365
VEHICLE WARNING LIGHT
Stanton M. Cagney, New York, N.Y., assignor to First National Precision Products, Inc., New York, N.Y.
Filed Oct. 30, 1981, Ser. No. 316,929
Term of patent 14 years
U.S. Cl. D26—28

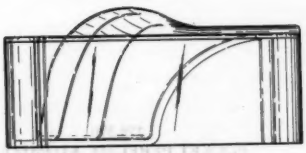


278,366
FLUORESCENT LANTERN
Keitchi Ohashi, Shizuoka, Japan, assignor to Skylight Industry Co., Ltd., Japan
Filed Dec. 13, 1982, Ser. No. 449,554
Term of patent 14 years
U.S. Cl. D26—42



278,367
MANICURE BOWL
Howard Sussman, 3101 NW. 25th St., Pompano Beach, Fla. 33060
Filed Jun. 27, 1983, Ser. No. 508,150
Term of patent 14 years
U.S. Cl. D28—61

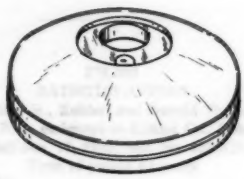




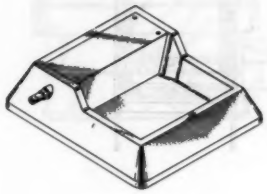
278,368
FINGERNAIL MOLD
Karin E. Valentiner, 23726 Alliene Ave., Torrance, Calif. 90501
Filed Nov. 8, 1982, Ser. No. 439,890
Term of patent 14 years
U.S. Cl. D28—56

278,369
HANGING LIGHTER HOLDER WITH CLIPPER
Larry E. Pringle, and Marsha S. Franklin, both of 1101 N. Pennsylvania, Oklahoma City, Okla. 73107
Filed Aug. 6, 1982, Ser. No. 406,085
Term of patent 14 years
U.S. Cl. D28—60

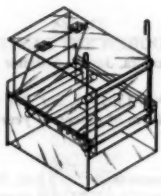
278,370
POCKET PERFUME ATOMIZER
Francois X. Speitel, Connerre, France, assignor to Societe Teleplastics Industries S.A., Parigne l'Eveque, France
Filed Dec. 21, 1982, Ser. No. 451,968
Claims priority, application France, Jun. 21, 1982, DM 001559
Term of patent 14 years
U.S. Cl. D28—91.1



278,371
PET WATERING DISH OR SIMILAR ARTICLE
George B. Strickland, P.O. Box 2343, Fayetteville, N.C. 28302
Filed Mar. 29, 1983, Ser. No. 479,891
Term of patent 14 years
U.S. Cl. D30—13



278,372
FEEDER ACCESSORY FOR A BIRD CAGE
Don Hartwick, 624 Ashland, Granite City, Ill. 62040
Filed Jan. 28, 1983, Ser. No. 461,857
Term of patent 14 years
U.S. Cl. D30—14

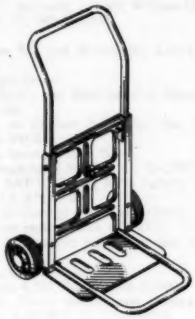


278,373

HAND TRUCK

Kenneth E. Rousseau, Wichita, Kans., assignor to Harper Truck, Inc., Wichita, Kans.

Filed Sep. 30, 1982, Ser. No. 432,117
Term of patent 14 years
U.S. Cl. D34—26



278,374

COUPON DISTRIBUTION MACHINE

Floyd H. Haker, 6546 Linden La., Dallas, Tex. 75230

Filed Aug. 12, 1982, Ser. No. 407,359
Term of patent 14 years
U.S. Cl. D99—99

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A.J. Gerrard & Company: *See*—
Simich, Emil, 4,509,416, Cl. 100-25.000.

Aaron Alarm Systems, Inc.: *See*—
Wolfe, Earle C., deceased; Jobsky, William G.; and Smith, Thomas P., 4,510,487, Cl. 340-566.000.

AB Celleco: *See*—
Frykhult, Rune H.; and Rundquist, Lars-Goran, 4,510,056, Cl. 210-512.100.

Abbott Laboratories: *See*—
Kirkemo, Curtis L.; and Shipchandler, Mohammed T., 4,510,251, Cl. 436-536.000.

Abbott, Vaughan, to Emhart Industries, Inc. Blowhead apparatus. 4,509,969, Cl. 65-300.000.

Ace Pak Company Incorporated: *See*—
Nakajima, Mutsuhiko, 4,509,312, Cl. 53-375.000.

Adam, Michel, to SAFT. Casing for a battery of cylindrical electric cells. 4,510,215, Cl. 429-99.000.

Adams, Jack C., to Energy Recovery Group, Inc. Waste material incineration system and method. 4,509,435, Cl. 110-344.000.

Adams, Louis E. Adjustable cultivator tool holder. 4,509,603, Cl. 172-427.000.

Adger Kogyo Co., Ltd.: *See*—
Iijima, Zenshiro, 4,509,982, Cl. 106-23.000.

Adler, Clarence E. Three dimensional cinema and novel projector system therefore. 4,509,835, Cl. 352-43.000.

Adolfsson, Bengt O., to Kommanditbolaget Aldolf. Arrangement for supplying gas to a liquid in a container therefor. 4,509,569, Cl. 141-360.000.

Adolph Coors Company: *See*—
Stirbis, James S., 4,509,555, Cl. 137-625.110.

Aerodyne Research, Inc.: *See*—
Mueller, Peter F.; and Caulfield, H. John, 4,510,575, Cl. 364-518.000.

AES Engineering Limited: *See*—
Garrett, Keith C., 4,509,762, Cl. 277-81.00R.

Agency of Industrial Science and Technology, The: *See*—
Haga, Ryoichi; Ishida, Masahiko; and Odawara, Yoji, 4,510,243, Cl. 435-167.000.
Yamaguchi, Yasuhiro; and Sakatani, Yoshiaki, 4,510,103, Cl. 264-40.200.

Ager, Ian R.: *See*—
Westwood, Robert; Miller, Peter; Ager, Ian R.; and Kay, David P., 4,510,143, Cl. 514-250.000.

Agfa-Gevaert Aktiengesellschaft: *See*—
Stahl, Werner; and Muller, Jurgen, 4,509,736, Cl. 271-11.000.

Aggeler, Michael J., to Texor Corporation. Method and apparatus for handling magnetic recording disks. 4,510,542, Cl. 360-98.000.

Ahlers, Egon, to Seitz Enzinger Noll Maschinenbau AG. Filling element for single-chamber and multi-chamber counterpressure filling machines. 4,509,565, Cl. 141-39.000.

Aida Engineering, Ltd.: *See*—
Kato, Yoshinori; Matsui, Makoto; and Nonaka, Zenichiro, 4,509,638, Cl. 198-486.000.

Air Products and Chemicals, Inc.: *See*—
Bennett, Douglas L.; Edwards, Thomas J.; and Rowles, Howard C., 4,510,023, Cl. 203-99.000.
Pierantozzi, Ronald, 4,510,267, Cl. 518-715.000.

Airpax Corporation: *See*—
Merchant, Donald K., 4,510,479, Cl. 337-91.000.

Aisan Kogyo Kabushiki Kaisha: *See*—
Nakai, Kenji, 4,509,693, Cl. 239-585.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Arai, Fuminao; Kodama, Hisashi; and Ono, Takuro, 4,509,467, Cl. 123-90.160.

Aisin Warner Kabushiki Kaisha: *See*—
Kawamoto, Matsumi, 4,509,627, Cl. 192-85.00F.
Sumiya, Koji; and Kuramochi, Kojiro, 4,509,391, Cl. 74-869.000.

Akada, Yasuaki: *See*—
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,509,842, Cl. 354-402.000.

Akagi, Motoo: *See*—
Morishita, Hajime; Akagi, Motoo; Nonogaki, Saburo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,510,226, Cl. 430-144.000.

Akagi, Yuji: *See*—
Hattori, Toshihiko; Akagi, Yuji; and Kohara, Hideo, 4,509,906, Cl. 418-152.000.

Akahoshi, Yutaka: *See*—
Kanno, Tadaaki; Ukai, Takeshi; Akahoshi, Yutaka; and Shibata, Katsuji, 4,509,732, Cl. 270-37.000.

Akatsuka, Takao: *See*—
Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, 4,510,396, Cl. 290-30.00R.

Akita, Teruo: *See*—
Miyake, Masao; and Akita, Teruo, 4,510,194, Cl. 428-212.000.

Akiyama, Mitsuo: *See*—
Suzuki, Akio; Akiyama, Mitsuo; Uzuhashi, Hideo; Ochiai, Izumi; Yamashita, Hitoshi; Sekine, Youji; Matsui, Katsuo; and Tomita, Syuji, 4,509,354, Cl. 72-294.000.

Akutsu, Hidezoh: *See*—
Ogata, Yoshiro; Yamazaki, Haruo; and Akutsu, Hidezoh, 4,510,415, Cl. 313-493.000.

Akutsu, Makoto. Picture recording method and apparatus. 4,510,511, Cl. 346-140.00R.

Akuzawa, Yoshihide: *See*—
Hira, Yutaka; Ukai, Yoshitaka; Akuzawa, Yoshihide; Aoki, Osamu; and Shimatani, Saburo, 4,509,874, Cl. 400-691.000.

Akyol, Atilla, to Rabewerk Heinrich Clausing. Method for applying wear-resistant coatings on working surfaces of tools and devices. 4,510,183, Cl. 427-185.000.

Alar Engineering Corporation: *See*—
White, Harold R., 4,510,055, Cl. 210-500.100.
White, Harold R., 4,510,061, Cl. 210-769.000.

Albert, Alban I.; Ballenegger, Marc E.; Overeem, Jan C.; and Tyson, Robert G., to Zyma SA. (+)-Cyanidan-3-ol derivatives, pharmaceutical preparations that contain such compounds, and the use of the latter to treat liver or venous diseases. 4,510,159, Cl. 514-456.000.

Albrecht, Hans: *See*—
Schall, Walter; Negro, Guido; Hipp, Martin; and Albrecht, Hans, 4,509,396, Cl. 83-126.000.

Alco Foodservice Equipment Company: *See*—
Schneider, William C., 4,510,376, Cl. 219-492.000.

Alfa-Laval Separation AB: *See*—
Eklof, Ulf, 4,510,052, Cl. 210-139.000.

Alfa Romeo Auto S.p.A.: *See*—
Bernardoni, Luigi; and Invernizzi, Umberto, 4,509,466, Cl. 123-52.0MF.

Alfieri, Charles. Hairpiece with simulated natural hairline front. 4,509,539, Cl. 132-53.000.

Algieri, Aldo A.: *See*—
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,510,309, Cl. 546-194.000.

Alio, Peter. Laundry heat recovery system. 4,509,345, Cl. 68-20.000.

Allemand, Robert; and Laval, Michel, to Commissariat a l'Energie Atomique. Material for scintillators. 4,510,394, Cl. 250-483.100.

Allen-Bradley Company: *See*—
Dummermuth, Ernst, 4,510,565, Cl. 364-136.000.

Allfather, Lars P., to Doble Engineering Company. Current tap selecting switch. 4,510,354, Cl. 200-11.00R.

Allied Colloids Limited: *See*—
Farrar, David; and Hawe, Malcolm, 4,509,987, Cl. 106-308.00Q.

Allied Corporation: *See*—
Anderson, Philip M., III; Bretts, Gerald R.; and Kearney, James E., 4,510,489, Cl. 340-572.000.
Anderson, Philip M., III; Kearney, James E.; and Bretts, Gerald R., 4,510,490, Cl. 340-572.000.
Costello, Samuel J.; and Sohne, Eric R., 4,509,255, Cl. 29-753.000.
Hesse, David L., 4,509,813, Cl. 339-91.00R.
Masilamani, Divakaran; and Manahan, Edward H., 4,510,321, Cl. 562-421.000.
Nash, Donald R., 4,509,493, Cl. 123-602.000.
Nijman, John P., 4,510,005, Cl. 156-221.000.
Thomas, Rudy V., 4,509,706, Cl. 242-107.40A.

Allis-Chalmers Corp.: *See*—
Russ, David E., 4,509,602, Cl. 172-311.000.

Allison, Lawrence S.: *See*—
Manciocchi, William D., Jr., 4,509,541, Cl. 132-90.000.

Allison, Philip J.; and Smith, Morley L., to T. S. Simms & Co. Limited. Unitary paint tray. 4,509,226, Cl. 15-257.060.

Almicro Electronics Inc.: *See*—
Wagner, Peter; and Shkawrytko, Victor, 4,510,350, Cl. 179-5.00P.

Altounyan, Roger E. C.; and Auty, Richard M., to Fisons plc. Inhalation device. 4,509,515, Cl. 128-200.230.

Aluminum Company of America: *See*—
Hovland, Lyle W.; and Klingensmith, James D., 4,510,502, Cl. 343-880.000.
Martin, Robert J.; Cisko, Lawrence W.; and Turley, Bernard C., 4,510,033, Cl. 204-245.000.

Amada Company Limited: *See*—
Yonekura, Mikio, 4,510,570, Cl. 364-476.000.

Amano, Katutoshi; and Kakuta, Toshio, to Sony Corporation; and Hosiden Electronic Co. Ltd. Printed-circuit board connector. 4,509,811, Cl. 339-17.00F.

AMAX Inc.: *See*—
Neelameggham, Ramaswami; Priscu, John C.; and Toomey, Robert D., 4,510,029, Cl. 204-130.000.

Ament, Frank; Peden, Richard A.; and Ausen, John E., to General Motors Corporation. Engine fuel control system. 4,509,478, Cl. 123-339.000.

American Cyanamid Company: *See*—
Kust, Cyril; and Bhalla, Prithvi, 4,509,973, Cl. 71-92.000.
Wood, Irwin B., 4,510,134, Cl. 514-27.000.

American Maplan Corporation: *See*—
Ratheiser, Heinz, 4,509,907, Cl. 425-197.000.

American Security Fence Company: *See*—
Boggs, William G.; VanDenburgh, David S.; and Valdez, Gabriel A., 4,509,726, Cl. 256-8.000.

Amjad, Zahid; and Yorke, Monica A., to Calgon Corporation. Carboxylic functional polyampholytes as silica polymerization retardants and dispersants. 4,510,059, Cl. 210-701.000.

AMP Incorporated: *See*—
Cooper, Ralph M.; and Mena, Walter M., 4,509,710, Cl. 248-73.000.
Locati, Ronald P.; and Rickrode, James A., 4,509,258, Cl. 29-876.000.

Amstelstaal B.V.: *See*—
Lassally, Gunter M., 4,509,721, Cl. 251-335.00B.

Anada, Harish R.: *See*—
Sears, John T.; and Anada, Harish R., 4,510,124, Cl. 423-437.000.

Anderson, David L.: *See*—
Mullally, Charles J.; Brown, Steven L.; Anderson, David L.; and Hitchcock, Robert F., 4,509,340, Cl. 62-503.000.

Anderson, John W., Jr.; and Roche, William J., to GTE Products Corporation. Rapid start fluorescent lamp with a bimetal electrode disconnect switch. 4,510,418, Cl. 315-73.000.

Anderson, Philip M., III; Bretts, Gerald R.; and Kearney, James E., to Allied Corporation. Surveillance system having magnetomechanical marker. 4,510,489, Cl. 340-572.000.

Anderson, Philip M., III; Kearney, James E.; and Bretts, Gerald R., to Allied Corporation. Coded surveillance system having magnetomechanical marker. 4,510,490, Cl. 340-572.000.

Ando, Yasuo; and Ochiai, Toshihiko, to Kabushiki Kaisha Meidensha. Electrolyte for zinc-bromine storage batteries. 4,510,218, Cl. 429-198.000.

Andreoli, Charles R., to United States of America, Navy. Tail fin firing device. 4,509,427, Cl. 102-261.000.

Andrie, Philippe; and Mimeur, Jacques, to Commissariat a l'Energie Atomique. Laser sensing means for dimensional control purposes. 4,509,263, Cl. 33-169.00R.

Angsten, Gregory S. Weight lifting device. 4,509,745, Cl. 272-130.000.

Anthony Foresi & Associates, Inc.: *See*—
Foresi, Anthony; and Naysmith, Peter, 4,509,740, Cl. 271-224.000.

Aoishi, Eiji: *See*—
Takeuchi, Tooru; Nakamura, Masaru; and Aoishi, Eiji, 4,510,201, Cl. 428-285.000.

Aoki, Naoki, to Konishiroku Photo Industry Co., Ltd. Universal paper feed cassette. 4,509,738, Cl. 271-160.000.

Aoki, Osamu: *See*—
Hira, Yutaka; Ukai, Yoshitaka; Akuzawa, Yoshihide; Aoki, Osamu; and Shimatani, Saburo, 4,509,874, Cl. 400-691.000.

Apparatebau Rothemuhle Brandt & Kritzler GmbH: *See*—
Michalak, Stanislaw; and Hermanns, Bernd, 4,509,584, Cl. 165-10.000.
Raths, Gunther, 4,509,583, Cl. 165-4.000.

Applied Power Inc.: *See*—
Stuart, Thomas G., 4,509,612, Cl. 180-89.140.

Araghi, Mehdi N., to Xerox Corporation. Optical image staggering/destaggering arrangement for multiple array scanning system. 4,509,826, Cl. 350-286.000.

Arai, Fuminao; Kodama, Hisashi; and Ono, Takuro, to Aisin Seiki Kabushiki Kaisha. Hydraulic lifter system for variable cylinder engines. 4,509,467, Cl. 123-90.160.

Arai, Katsumi: *See*—
Kobayashi, Minoru; Sakai, Yoshiya; Minato, Shoji; Ooe, Tsuguo; Arai, Katsumi; and Suga, Tetsuo, 4,510,374, Cl. 219-146.100.

Arai, Masami: *See*—
Hoshi, Ikuo; Arai, Masami; Yokochi, Kiyoshi; Miyadera, Yasuo; Fujioka, Atsushi; and Nakagawa, Takehisa, 4,510,008, Cl. 156-245.000.

Arai, Sumio: *See*—
Nakai, Ryozo; Inoue, Shigeo; and Arai, Sumio, 4,510,074, Cl. 252-400.230.

Arai, Takao: *See*—
Morita, Seiichiro; Yuasa, Akihiko; and Arai, Takao, 4,509,236, Cl. 29-26.00A.

Arai, Toshihiro: *See*—
Matsumura, Michio; Inoue, Takao; and Arai, Toshihiro, 4,510,031, Cl. 204-159.200.

Arakawa, Kazuhiko: *See*—
Katsuma, Makoto; Hiramatsu, Akira; Arakawa, Kazuhiko; and Murakami, Hiroyasu, 4,509,848, Cl. 354-473.000.

Arakawa, Nobuyuki: *See*—
Kishimura, Masaaki; and Arakawa, Nobuyuki, 4,510,279, Cl. 524-144.000.

Araki, Ichiro: *See*—
Yoshida, Shigemasa; and Araki, Ichiro, 4,510,537, Cl. 360-78.000.

Arditty, Herve ; Bourbin, Yannic; Dubos, Jacques; Gautnier, Francis; and Graindorge, Philippe, to Thomson - CSF. Device for providing a drawn fiber-like object with a helical structure. 4,509,968, Cl. 65-10.100.

Arena, Blaise J., to UOP Inc. Increasing catalyst lifetime in hydrogenation of a carbohydrate in aqueous solution. 4,510,339, Cl. 568-863.000.

Arends, Albert W., to Leesona Corporation. Clamp mechanism for differential pressure thermoformer. 4,509,909, Cl. 425-388.000.

Arikado, Tsunetoshi: *See*—
Higashikawa, Iwao; and Arikado, Tsunetoshi, 4,510,173, Cl. 427-44.000.

Arikawa, Junichi: *See*—
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.

Arita, Masashi: *See*—
Ike, Masahide; and Arita, Masashi, 4,509,353, Cl. 72-267.000.

Armstrong Jones Inc.: *See*—
Jones, William H., 4,509,961, Cl. 55-294.000.

Arndt, Frederick P., to General Motors Corporation. Spring and retainer assembly and spring delashed steering shafts. 4,509,775, Cl. 280-779.000.

Arney, Neil E. Baker's rack. 4,509,652, Cl. 211-126.000.

Arnoldt, Peter J., to Ductmate Industries. Duct joint assembly. 4,509,778, Cl. 285-406.000.

Arntz-Optibelt KG: *See*—
Muller, Alexander, 4,509,936, Cl. 474-148.000.

Arrow Display Company, Inc.: *See*—
Nemitz, Anthony R., 4,510,353, Cl. 200-5.00A.

Arroyo, Candido J.; Cogelia, Nicholas J.; and Darsey, Ralph J., to AT&T Technologies, Inc.; and AT&T Bell Laboratories. Nonshielded, fire-resistant plenum cable. 4,510,348, Cl. 174-121.00A.

Arthur Smith Industries, Inc.: *See*—
Konle, Robert L., 4,509,292, Cl. 49-499.000.

Arturo Salice, S.p.A.: *See*—
Salice, Luciano, 4,509,229, Cl. 16-327.000.

Artusi, Aldo; and Hagmann, Peter. Apparatus for sealing a film or foil or the like on to a container. 4,510,014, Cl. 156-522.000.

Arvey Corporation: *See*—
Sak, Dennis A.; and Mestetsky, Thomas, 4,510,621, Cl. 383-89.000.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; Sugihara, Taisuke; Takagi, Seiji; and Sako, Kiyohide, 4,510,307, Cl. 544-283.000.
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,510,328, Cl. 568-32.000.
Ohshima, Shohzo; Kusuda, Mikio; and Isoya, Toshiro, 4,510,034, Cl. 204-290.00F.

Asahi Kasei Textiles Ltd.: *See*—
Miyake, Masao; and Akita, Teruo, 4,510,194, Cl. 428-212.000.

Asai, Hajime: *See*—
Kishida, Kazuo; Sasaki, Isao; Mukai, Nobuhiro; and Asai, Hajime, 4,510,024, Cl. 204-59.00R.

Asami, Shojiro; Ozawa, Kazuo; and Sawa, Tetsuo, to Sony Corporation. Flexible magnetic disc cassette. 4,510,546, Cl. 360-133.000.

Ashikaga, Tadashi; and Terashima, Masayuki, to Kabushiki Kaisha Meidensha. Vector control method and system for an induction motor. 4,510,430, Cl. 318-800.000.

Ashurkoff, Peter: *See*—
Harrison, Bobby J.; and Ashurkoff, Peter, 4,509,567, Cl. 141-97.000.

Assbeck, Franz; and Fleckenstein, Volker, to Siemens Aktiengesellschaft. Method and apparatus for the automatic setting of the optimum operating point of a d-c voltage source. 4,510,434, Cl. 323-237.000.

Asselin, Andre A.; and Humber, Leslie G., to Ayerst, McKenna & Harrison, Inc. 6,7,8,9-Tetrahydro-1H-benz(g)indol-8-amine derivatives. 4,510,157, Cl. 514-411.000.

Astolfi, Pietro, to Pico-Glass S.p.A. Clip for portrait frames and the like. 4,509,278, Cl. 40-156.000.

AT&T Bell Laboratories: *See*—
Arroyo, Candido J.; Cogelia, Nicholas J.; and Darsey, Ralph J., 4,510,348, Cl. 174-121.00A.
Bursh, Talmage P., Jr.; Davis, Dean I.; Slominski, John T.; and Swartz, Raymond K., 4,510,346, Cl. 174-36.000.
Camlibel, Irfan; and Chin, Aland K., 4,510,514, Cl. 357-17.000.
Costello, Peter E.; Fossett, Lawrence D.; Lane, Michael S.; Quin, Terrence T.; and Smith, Nicholas K., 4,510,351, Cl. 179-27.00D.
Cuthbert, John D.; and Soos, Nicholas A., 4,510,176, Cl. 427-82.000.
Glance, Bernard; and Greenstein, Lawrence J., 4,510,595, Cl. 370-32.000.
Johnson, James M., Jr., 4,510,594, Cl. 370-15.000.
Spires, Dewayne A., 4,510,550, Cl. 361-152.000.

AT&T Bell Labs: *See*—
Hartmann, Philip W.; Kohs, Dwight W.; Spencer, Douglas A.; and Turnbow, Garry V., 4,510,596, Cl. 370-58.000.

AT&T Technologies, Inc.: *See*—
Arroyo, Candido J.; Cogelia, Nicholas J.; and Darsey, Ralph J., 4,510,348, Cl. 174-121.00A.
Bursh, Talmage P., Jr.; Davis, Dean I.; Slominski, John T.; and Swartz, Raymond K., 4,510,346, Cl. 174-36.000.

Ataman, Ergin; and King, J. Thomas, to NCR Canada Ltd - NCR Canada LTEE. Noise cleaner for binary images. 4,510,618, Cl. 382-54.000.

Atlantic Richfield Company: *See*—
Berman, Elliot, 4,510,344, Cl. 136-256.000.
Emery, Leonard W., 4,509,596, Cl. 166-263.000.
Miller, Richard F.; and Nicholson, Michael P., 4,510,041, Cl. 208-48.0AA.

Atlas Copco Aktiebolag: *See—*
Skogberg, Bo T.; and Romell, Gunnar V. R., 4,509,889, Cl. 411-19.000.

Atsumi, Haruo; and Koizumi, Haruyuki, to Omron Tateisi Electronics Co. Rotary shaft - push button switch anchor assembly. 4,510,355, Cl. 200-47.000.

Atsuta, Toshio: *See—*
Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, 4,509,776, Cl. 285-55.000.

Auer, Robert, to Coulter Electronics, Inc. Coincidence correction in particle analysis system. 4,510,438, Cl. 324-71.400.

Aurora Equipment Company: *See—*
Evans, Robert J., 4,509,649, Cl. 211-70.600.

Ausen, John E.: *See—*
Ament, Frank; Peden, Richard A.; and Ausen, John E., 4,509,478, Cl. 123-339.000.

Austin, Forrest L.; and Bebeau, Jerald R., to Cornelius Company, The. Carbonated beverage mixing nozzle for a dispenser. 4,509,690, Cl. 239-429.000.

AUTOFLUG GmbH: *See—*
Ernst, Hans-Hellmut; and Seel, Holger, 4,509,707, Cl. 242-107.40A.

Automatic Orange Juicer Corp., The: *See—*
Nelson, Stewart C., 4,509,418, Cl. 100-97.000.

Auty, Richard M.: *See—*
Altounyan, Roger E. C.; and Auty, Richard M., 4,509,515, Cl. 128-200.230.

Avco Corporation: *See—*
Loszewski, Raymond C., 4,510,272, Cl. 523-400.000.

Axis Products Limited: *See—*
Martin, Edward T., 4,509,411, Cl. 98-34.500.

Ayerst, McKenna & Harrison, Inc.: *See—*
Asselin, Andre A.; and Humber, Leslie G., 4,510,157, Cl. 514-411.000.

Azuma, Yusaku; Kitayama, Yoshifumi; and Kawaida, Shinji, to Bridgestone Tire Company Limited. Strip deforming apparatus. 4,510,011, Cl. 156-407.000.

B. F. Goodrich Company, The: *See—*
Huang, Chor; and Schlatzer, Robert K., 4,509,949, Cl. 586-558.000.

Babcock & Wilcox Company, The: *See—*
Smith, Jane E.; and Whitford, Rowland E., 4,509,547, Cl. 137-85.000.

Bagolini, Carlo: *See—*
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and de Witt, Paolo, 4,510,318, Cl. 560-147.000.

Bailey, Denis M., to Sterling Drug Inc. Substituted aminobenzamides and their use as agents which inhibit lipoxygenase activity. 4,510,139, Cl. 514-234.000.

Bailey, Denis M., to Sterling Drug Inc. 2-Phenylindole derivatives, their use as complement inhibitors. 4,510,158, Cl. 514-415.000.

Baker, Alan S., to Imperial Chemical Industries PLC. Emulsifying agents. 4,509,950, Cl. 44-51.000.

Baker, Donal E., to Westinghouse Electric Corp. Demodulator circuit for parallel AC power systems. 4,510,399, Cl. 307-57.000.

Baker Oil Tools, Inc.: *See—*
Chenoweth, David V.; and McStravick, David M., 4,509,599, Cl. 166-370.000.

Balaskas, Spyros, to Vereinigte Flugtechnische Werke GmbH. Hydraulic control valve with maintenance-facilitating feature. 4,509,407, Cl. 91-466.000.

Balius, Donald G. External transfer case chain slack adjustment structure. 4,509,934, Cl. 474-136.000.

Ballenegger, Marc E.: *See—*
Albert, Alban I.; Ballenegger, Marc E.; Overeem, Jan C.; and Tyson, Robert G., 4,510,159, Cl. 514-456.000.

Ban, Toshika: *See—*
Takao, Mitsunori; and Ban, Toshika, 4,510,569, Cl. 364-431.120.

BancTec, Incorporated: *See—*
LeBrun, Thomas Q.; Torkelson, John; Dempster, Roy E.; and Van Tyne, Richard G., 4,510,619, Cl. 382-57.000.

Bando, Niro; Kurohara, Kazuaki; Fujima, Yasuo; Ikeda, Fumihiro; Usiro, Kenzo; and Ogasawara, Hiroyuki, to Kubota Ltd. Working vehicle equipped with engine automatic stop device. 4,509,614, Cl. 180-273.000.

Bar, Vilmos; Boszormenyi, Jozsef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, to Material Vegyipari Szovetkezet; and Human Oltoanyagtermelo Es Kutato Intezet, a part interest. Compositions for and medical use of water-soluble derivatives of 6,6-methylene-bis-(2,2,4-trimethyl-1,2-dihydroquinoline). 4,510,147, Cl. 514-314.000.

Barajas, Felix, to McDonnell Douglas Corporation. Solder composition for high-density circuits. 4,509,994, Cl. 148-24.000.

Barber, Larry J., to Mesa Technology. Testable tape for bonding leads to semiconductor die and process for manufacturing same. 4,510,017, Cl. 156-651.000.

Barber, Michael; and Lloyd, Charles F., to CTS Corporation. Electromagnetically operated hydraulic valve device with snap-together valve housing. 4,509,716, Cl. 251-141.000.

Barnes, Stephen R.; Tarbox, Gary L.; Huntsman, Lee L.; and McLaren, Barry D., to Lawrence Medical Systems, Inc. Method and system for non-invasive ultrasound Doppler cardiac output measurement. 4,509,526, Cl. 128-663.000.

Baron, George B., to Dresser Industries, Inc. Crowd drive assembly for power shovels. 4,509,895, Cl. 414-685.000.

Barr, William A. Parking brake safety mechanism for automatic transmissions. 4,509,624, Cl. 192-4.00A.

Barrett, Michael E.; Koon, Randy G.; and Laughon, Thomas C., to Singer Company, The. Mounting for electronic circuit board in power hand tool. 4,510,404, Cl. 310-50.000.

Barry, Carol M. F.: *See—*
Kuehnle, Manfred R.; Martinez, Ferdinand; Runyan, I. V.; and Barry, Carol M. F., 4,510,223, Cl. 430-44.000.

Barry, Eugene F.: *See—*
Hubball, John A.; and Barry, Eugene F., 4,509,964, Cl. 55-386.000.

Barry, Terrence J. Headache relief method. 4,509,521, Cl. 128-421.000.

Bartelink, Dirk J. Three-electrode MOS electron device. 4,510,516, Cl. 357-23.100.

Bartelloni, Rene , to Papeteries de Jeand'heurs. Latex containing papers. 4,510,019, Cl. 162-141.000.

Barth, Walter; and Kremser, Harald H., to Bleistiftmaschinenfabrik Dipl. Ing. Karl Zuber GmbH & Co. KG. Apparatus for securing parts on elongated writing instruments, in particular for securing an eraser for a sheath receiving it on a pencil. 4,509,245, Cl. 29-525.000.

BASF Aktiengesellschaft: *See—*
Gimpel, Jurgen; Jackel, Klaus-Peter; and Sander, Hans, 4,510,284, Cl. 524-379.000.
Lechtken, Peter; Nuerrenbach, Axel; and Schole, Juergen, 4,510,146, Cl. 514-312.000.

BASF Wyandotte Corporation: *See—*
Langdon, William K., 4,510,306, Cl. 536-127.000.
Ozmeral, Ahmet C., 4,510,067, Cl. 252-174.210.

Batchelor, Douglas R., to Libman Broom Company. Refill sponge mop assembly. 4,509,224, Cl. 15-244.00R.

Bates, H. John, to NL Industries, Inc. Control valve system for blowout preventers. 4,509,405, Cl. 91-420.000.

Bates, Paul E.: *See—*
Grogg, Terry W.; Bugaj, Joseph E.; and Bates, Paul E., 4,510,125, Cl. 424-1.100.

Bathke, Heinz: *See—*
Lorenz, Werner; Bathke, Heinz; and Sommers, Hans, 4,509,913, Cl. 431-90.000.

Battle, Carl W. Legal educational game and method of teaching legal subject matter. 4,509,922, Cl. 434-322.000.

Baudis, Ulrich: *See—*
Beyer, Hans-Hermann; Baudis, Ulrich; and Biberbach, Peter, 4,509,993, Cl. 148-15.500.

Bauer, Adolf, to Krauss-Maffei Aktiengesellschaft. Mixing head. 4,510,120, Cl. 422-133.000.

Bauer, Gerd F., to Modern Equipment Company. Method and apparatus for the treatment of iron with a reactant. 4,509,979, Cl. 75-130.00R.

Baxter Travenol Laboratories, Inc.: *See—*
Gokcen, Cem; and Williams, Robert J., 4,510,115, Cl. 264-515.000.

Bayer Aktiengesellschaft: *See—*
Eckstein, Udo, 4,510,311, Cl. 548-132.000.
Forster, Heinz; Hofer, Wolfgang; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,509,971, Cl. 71-90.000.
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, 4,510,156, Cl. 514-415.000.
Kolb, Gunter, deceased; Tork, Leo; and Hohne, Wolfgang, 4,510,302, Cl. 526-264.000.
Kopp, Richard; and Freitag, Hans-Albrecht, 4,510,269, Cl. 521-166.000.
Meyer, Rolf-Volker; Kreuder, Hans-Joachim; and Hohl, Erwin, 4,510,288, Cl. 525-111.000.
Pflugbeil, Wolf-Dietrich; and Kramer, Wolfgang, 4,510,314, Cl. 548-262.000.
Wehinger, Egbert; Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Towart, Robertson; Stoepel, Kurt; and Kazda, Stanislay, 4,510,310, Cl. 546-321.000.
Wild, Peter; and Stohr, Frank-Michael, 4,509,948, Cl. 8-539.000.
Winkler, Hermann; and Sachs, Hanns I., 4,510,184, Cl. 427-212.000.

Bayerische Motoren Werke AG: *See—*
Minner, Willy; Krappel, Alfred; and Guggenmos, Johannes, 4,509,482, Cl. 123-418.000.

Baynes, Gene P.; and Melinat, Wolfgang, to General Motors Corporation. Shoe mounted disc brake caliper and shoe support structure. 4,509,619, Cl. 188-73.390.

BBC Brown, Boveri & Company, Limited: *See—*
Furrer, Andreas; and Milavec, Johann, 4,510,457, Cl. 330-10.000.

Beasley, Robert L. Aquatic exercise device with rigid fluid resistance member. 4,509,744, Cl. 272-116.000.

Beaudet, Emilien, to Exxon Research and Engineering Co. Heat insulating panel. 4,509,307, Cl. 52-309.400.

Bebeau, Jerald R.: *See—*
Austin, Forrest L.; and Bebeau, Jerald R., 4,509,690, Cl. 239-429.000.

Becker, Udo: *See—*
Fuhge, Peter; Braun, Konrad; and Becker, Udo, 4,510,126, Cl. 424-3.000.

Beckman Instruments, Inc.: *See—*
Miller, Steven P.; and Quan, Stella S. M., 4,510,239, Cl. 435-7.000.

Beckman, John A.: *See—*
Davis, Kevin M.; Wahl, Timothy M.; Beckman, John A.; and Isele, Karl J., Jr., 4,509,727, Cl. 266-44.000.

Beecham Group p.l.c.: *See—*
Faruk, Erol A., 4,510,152, Cl. 514-321.000.

Bell, Graeme I.: *See—*
Cousens, Lawrence S.; Bell, Graeme I.; and Valenzuela, Pablo D. T., 4,510,245, Cl. 435-172.300.

Bell & Howell Company: *See—*
Kosner, Jerry J., 4,509,735, Cl. 271-11.000.

Bell Manufacturing Company: *See*—
Cockburn, Harrold; Weatherly, Darrel; and Yarbro, Earl, 4,509,468, Cl. 123-90.380.
Bell Telephone Laboratories, Inc.: *See*—
Shevchuk, George J., 4,509,647, Cl. 211-41.000.
Bellows, James C., to Westinghouse Electric Corp. Apparatus for monitoring corrosive salt solutions in a low pressure steam turbine. 4,509,332, Cl. 60-660.000.
Benasutti, John E.: *See*—
Braun, Robert E.; and Benasutti, John E., 4,510,446, Cl. 324-158.00R.
Benckiser-Knapsack GmbH: *See*—
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,510,068, Cl. 252-186.290.
Bendall, Brian; and Flannery, Stephen W., to Meynell Valves Limited. Mixing valve. 4,509,677, Cl. 236-122.000.
Bennett, Douglas L.; Edwards, Thomas J.; and Rowles, Howard C., to Air Products and Chemicals, Inc. Perforated bubble caps for enhanced vapor/liquid contact on a distillation tray. 4,510,023, Cl. 203-99.000.
Bennett, Jackie D.; Bennett, Johnnie R.; and Bennett, Jimmie D., Jr., to 3-J-Co., Inc. Tobacco stripper. 4,509,536, Cl. 130-30.00R.
Bennett, Jimmie D., Jr.: *See*—
Bennett, Jackie D.; Bennett, Johnnie R.; and Bennett, Jimmie D., Jr., 4,509,536, Cl. 130-30.00R.
Bennett, Johnnie R.: *See*—
Bennett, Jackie D.; Bennett, Johnnie R.; and Bennett, Jimmie D., Jr., 4,509,536, Cl. 130-30.00R.
Bensadoun, Michel, to Electricite de France Service National. Liquid rheostat for starting an electric motor with improved sill structure. 4,510,483, Cl. 338-80.000.
Benson, Clark K.: *See*—
Caridis, Andrew A.; Benson, Clark K.; and Klein, Lawrence F., 4,510,165, Cl. 426-439.000.
Berg, Lloyd; and Yeh, An-I. Separation of isopropyl ether from isopropanol and water by extractive distillation. 4,510,022, Cl. 203-51.000.
Bergen, Franciscus H. M., to U.S. Philips Corporation. Smear reduction for a television pickup. 4,510,528, Cl. 358-213.000.
Bergwerksverband GmbH: *See*—
Cornely, Wolfgang; Esser, Heinz; and Schmidt, Rudolf, 4,510,180, Cl. 427-136.000.
Berman, Elliot, to Atlantic Richfield Company. Thin film solar cell substrate. 4,510,344, Cl. 136-256.000.
Bernardoni, Luigi; and Invernizzi, Umberto, to Alfa Romeo Auto S.p.A. Diesel engine with an effective compression ratio substantially equal to the geometrical compression ratio. 4,509,466, Cl. 123-52.0MF.
Bernhard, Horst, to Merck Patent Gesellschaft mit beschrankter Haftung. Nacreous pigments having improved light fastness, their preparation and use. 4,509,988, Cl. 106-308.00R.
Bertec Inc.: *See*—
Therrien, Gaston, 4,509,217, Cl. 5-430.000.
Berthold, Richard, to Sandoz Ltd. Pharmaceutical compositions effective against coronary heart disease and hypertension. 4,510,150, Cl. 514-338.000.
Bessman, Samuel P., to Spectrum Medical Industries, Inc. Tissue pulverizer. 4,509,695, Cl. 241-2.000.
Beta Technology, Inc.: *See*—
Livingston, James W.; and Schontzler, James G., 4,509,543, Cl. 134-57.00D.
Bettcher Industries, Inc.: *See*—
Bettcher, Louis A., 4,509,261, Cl. 30-276.000.
Bettcher, Louis A., to Bettcher Industries, Inc. Boning and trimming knife and housing. 4,509,261, Cl. 30-276.000.
Betz, Dieter; and Issler, Jorg, to Robert Bosch GmbH. Ignition coil for a multi-cylinder internal combustion engine. 4,509,495, Cl. 123-643.000.
Beyer, Hans-Hermann; Baudis, Ulrich; and Biberbach, Peter, to Degussa Aktiengesellschaft. Regeneration agent for carburization salt bath. 4,509,993, Cl. 148-15 500.
Bezak, Michael J. Foot holding apparatus for sit-ups and like exercises. 4,509,748, Cl. 272-145.000.
Bezdicek, Jan: *See*—
Pajgrt, Jan; Bezdicek, Jan; and Novak, Jiri, 4,509,629, Cl. 192-0.098.
Bezwada, Rao S.; Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., to Ethicon, Inc. Absorbable polymers of substituted benzoic acid. 4,510,295, Cl. 525-437.000.
Bhalla, Prithvi: *See*—
Kust, Cyril; and Bhalla, Prithvi, 4,509,973, Cl. 71-92.000.
Biberbach, Peter: *See*—
Beyer, Hans-Hermann; Baudis, Ulrich; and Biberbach, Peter, 4,509,993, Cl. 148-15.500.
Bickley, Robert H.; Bucher, Charles A.; and Yee, David M., to Motorola, Inc. High power RF relay switch trigger. 4,510,472, Cl. 333-262.000.
Bielomatik Leuze GmbH & Co.: *See*—
Schall, Walter; Negro, Guido; Hipp, Martin; and Albrecht, Hans, 4,509,396, Cl. 83-126.000.
Bienert, Horst; Kohlpaintner, Georg; and Jardin, Hans, to Webasto-Werk W. Baier GmbH & Co. Rigid cover for a vehicle top. 4,509,791, Cl. 296-216.000.
Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve, to Institut Francais du Petrole. Heavy oil process with hydrovisbreaking, hydrodemetallation and hydrodesulfuration. 4,510,042, Cl. 208-59.000.
Biolectron, Inc.: *See*—
Dugot, Richard S., 4,509,520, Cl. 128-419.00F.
Bisbee, Gary W.: *See*—
McTamaney, Louis S.; Delfino, Allan B.; and Bisbee, Gary W., 4,509,901, Cl. 417-18.000.
Blacklock, Thomas J.; and Shuman, Richard F., to Merck & Co., Inc. Process for preparing polypeptides. 4,510,083, Cl. 260-112.50R.
Blaine, Edward H.; Cragoe, Edward J., Jr.; Hirschmann, Ralph F.; Nancarrow, John F., deceased; by Nancarrow, Elisabeth M., executrix; and Tobert, Jonathan A., to Merck & Co., Inc. Indacrinone having enhanced uricosuric. 4,510,322, Cl. 514-255.000.
Blair, Howard D.: *See*—
Ezis, Andre; and Blair, Howard D., 4,510,107, Cl. 264-65.000.
Blecherman, Sol S., to United Technologies Corporation. Acoustical liners. 4,509,616, Cl. 181-214.000.
Bleistiftmaschinenfabrik Dipl. Ing. Karl Zuber GmbH & Co. KG: *See*—
Barth, Walter; and Kremser, Harald H., 4,509,245, Cl. 29-525.000.
Blevins, Theodore J.; and Swiderski, Paul R., to Hoover Universal, Inc. Sofa bed mechanism. 4,509,216, Cl. 5-13.000.
Blin, Jean H. P. Variable volume fluid induction and delivery machine. 4,509,410, Cl. 92-89.000.
Bloo, Johann: *See*—
Schonberger, Johann; Bloo, Johann; Mistlberger, Bruno; and Gehmaier, Johann, 4,509,562, Cl. 139-13.00R.
Blossfeld, Lothar, to ITT Industries, Inc. Process for manufacturing a monolithic integrated circuit comprising at least one bipolar planar transistor. 4,509,250, Cl. 29-578.000.
Blount, Frederick T., to International Business Machines Corp. Binary number substitution mechanism. 4,510,582, Cl. 364-900.000.
Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest. Filter sheet material. 4,510,193, Cl. 428-196.000.
Blumel, Reinhard: *See*—
Markart, Ernst; Blumel, Reinhard; and Eggert, Holger, 4,509,859, Cl. 356-446.000.
Bluthe, Norbert; Gore, Jacques; and Malacria, Max, to Rhone-Poulenc Sante. Process for the preparation of δ-ethylenic carbonyl compounds. 4,510,330, Cl. 568-403.000.
Bly, Kenneth B.: *See*—
Dimick, David L.; Bly, Kenneth B.; and Ludecke, Otto A., 4,509,966, Cl. 55-502.000.
Board of Regents, The University of Texas, The: *See*—
Linner, John G., 4,510,169, Cl. 427-4.000.
Boday, Otto ; Herpay, Andras; Krajcsovics, Ferenc; Neveri, Istvan; Pete, Sandor; Pocsy, Ferenc; Szikora, Bela; and Szirmai, Endre, to Villamosipari Kutato Intezel. Procedure and equipment for destroying waste by plasma technique. 4,509,434, Cl. 110-238.000.
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, to International Flavors & Fragrances Inc. Organoleptic uses of hydrocarbyloxy alkanals. 4,510,080, Cl. 252-522.00R.
Boden, Richard M.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,510,340, Cl. 568-884.000.
Bodine, Fred R.: *See*—
Kuperman, Gilbert G.; and Bodine, Fred R., 4,510,525, Cl. 358-88.000.
Boehlke, Horst R. E.; Loschen, Gerriet K. H.; Michel, Gudrun E.; and Muller, Bernd, to Gruenenthal GmbH. Cis-bicyclo[3.3.0]octane derivatives, medicaments containing them and processes for their preparation and use. 4,510,323, Cl. 514-530.000.
Boehringer Mannheim GmbH: *See*—
Ruppender, Uwe, 4,510,383, Cl. 235-462.000.
Schrenk, Jurgen, 4,510,240, Cl. 435-7.000.
Boggs, William G.; VanDenburgh, David S.; and Valdez, Gabriel A., to American Security Fence Company. Barrier. 4,509,726, Cl. 256-8.000.
Bogosoff, John P., to General Motors Corporation. Storage retainer for wheel cover wrench. 4,509,789, Cl. 296-37.200.
Boguslawski, George: *See*—
Whitted, Beth E.; and Boguslawski, George, 4,510,247, Cl. 435-207.000.
Boilard, Raynald, to Fernand Flamand Ltee. Door frame assembly. 4,509,294, Cl. 49-504.000.
Bolton, Edgar A., to Registration Control Systems. Combination badge and card holder. 4,509,277, Cl. 40-1.500.
Bolton, Gerald L.; and Weir, Donald R., to Sherritt Gordon Mines Limited. Process for recovering zinc from zinc ferrite material. 4,510,028, Cl. 204-119.000.
Bonapace, Franco: *See*—
Cosentino, Roberto F.; and Bonapace, Franco, 4,510,170, Cl. 427-33.000.
Boniface, Edmund A.: *See*—
Morgan, Walter R.; Boniface, Edmund A.; and Huben, Clayton A., 4,509,325, Cl. 60-39.141.
Bonneau, Paul; Holshouser, Howard E.; and Rogers, Terrence E., to General Electric Company. Television channel lockout. 4,510,623, Cl. 455-181.000.
Booher, Benjamin V. Composite control arm apparatus. 4,509,774, Cl. 280-694.000.
Booker, Reginald A., to Du Pont de Nemours, E. I., and Company. In situ film hardening with aldehyde bisulfite and nonhardening aldehyde. 4,510,237, Cl. 430-621.000.
Boothman, David R., to General Electric Company. Rotor protection apparatus and method. 4,510,548, Cl. 361-25.000.

Bora, Nayana S.: *See—*
Ho, Ping-Pei; Gorin, Brian A.; and Bora, Nayana S., 4,509,817, Cl. 350-3.610.

Borg-Warner Corporation: *See—*
Ledvina, Timothy J.; and Mead, Robert H., 4,509,323, Cl. 59-8.000.
Ledvina, Timothy J.; and Mead, Robert H., 4,509,937, Cl. 474-213.000.
Wentworth, Robert S., 4,509,773, Cl. 277-82.000.

Borlinghaus, Hans J.: *See—*
Colautti, Albert J.; and Borlinghaus, Hans J., 4,509,382, Cl. 74-424.80R.

Bormioli, Giorgio. Ball valve with rotary-translatory movement for fluid products at very high or very low temperature. 4,509,718, Cl. 251-163.000.

Borrow, Edgar W. Apparatus for mixing milk with flavoring and fluoride. 4,509,863, Cl. 366-162.000.

Bossert, Friedrich: *See—*
Wehinger, Egbert; Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Towart, Robertson; Stoepel, Kurt; and Kazda, Stanislay, 4,510,310, Cl. 546-321.000.

Boszormenyi, Jozsef: *See—*
Bar, Vilmos; Boszormenyi, Jozsef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,510,147, Cl. 514-314.000.

Bottcher, Wolfgang; Juttner, Heinz; Maurer, Albrecht; and Stutzinger, Ferdinand, to Estel Hoesch Werke Aktiengesellschaft. Controlled grinding of rollers for elimination of cracks. 4,509,295, Cl. 51-49.000.

Bouchard, Kenneth J.: *See—*
Cooper, David C.; and Bouchard, Kenneth J., 4,509,220, Cl. 10-86.00A.

Boudreau, Normand. Capstan cleaner for eight-track cassettes. 4,510,545, Cl. 360-128.000.

Boudreaux, Harry J.; Card, David C.; and Hanson, Bernard M., to UOP Inc. Pipe base well screen and system for joining a plurality of well screen segments. 4,509,600, Cl. 166-381.000.

Bourbin, Yannic: *See—*
Arditty, Herve ; Bourbin, Yannic; Dubos, Jacques; Gautnier, Francis; and Graindorge, Philippe, 4,509,968, Cl. 65-10.100.

Bourque, Rene, to Warrington Inc. Composite skate boot and method of making the same. 4,509,276, Cl. 36-115.000.

Boutant, Jean-Jacques: *See—*
Lamy, Jean-Michel; and Boutant, Jean-Jacques, 4,509,384, Cl. 74-473.00R.

Bouvet, Jean; and Teasdale, Robert D. Apparatus for treating the joints of the human body. 4,509,509, Cl. 128-24.100.

Bowman, David F., to RCA Corporation. Selective waveguide mode converter. 4,510,469, Cl. 333-21.00R.

Boyce, William C.; Wittekind, Warren D.; Howard, Leroy C.; Hall, Thomas E.; and Lechelt, Wayne M., to UNC Nuclear Industries, Inc. Method for X-ray fluorescence spectroscopy. 4,510,573, Cl. 364-498.000.

Boyd, Robert D.: *See—*
Summers, Mark A.; Eimerl, David; and Boyd, Robert D., 4,510,402, Cl. 307-427.000.

Boyer, Paul K.: *See—*
Collins, George J.; Thompson, Lance R.; Rocca, Jorge J.; and Boyer, Paul K., 4,509,451, Cl. 118-50.100.

Bozza, Ireneo. Band wrapping machine for the packaging of parcels of boxes or products. 4,509,314, Cl. 53-586.000.

Braid, Milton; and Landis, Phillip S., to Mobil Oil Corporation. Fuel additive and method of use. 4,509,956, Cl. 44-68.000.

Brain, Archibald I. J. Artificial airway device. 4,509,514, Cl. 128-207.150.

Brainard, Edward C., II, to ENDECO Canada Limited. Portable memory module. 4,510,551, Cl. 361-398.000.

Brandenstein, Manfred; Hans, Rudiger; and Kiener, Heinz, to SKF Kugellagerfabriken GmbH. Sealing arrangement. 4,509,764, Cl. 277-166.000.

Brandt, Eckhard; and Wolf, Wolfram, to E.C.H. Will (GmbH & Co.). Apparatus for expelling air from stacks of paper sheets or the like. 4,509,417, Cl. 100-90.000.

Branson Ultrasonics Corporation: *See—*
Smith, Jeffrey C., 4,510,053, Cl. 210-175.000.

Branzoli, Umberto: *See—*
Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, 4,510,149, Cl. 514-341.000.

Braun, Konrad: *See—*
Fuhge, Peter; Braun, Konrad; and Becker, Udo, 4,510,126, Cl. 424-3.000.

Braun, Robert E.; and Benasutti, John E., to Burroughs Corporation. Test coupons for determining the registration of subsurface layers in a multilayer printed circuit board. 4,510,446, Cl. 324-158.00R.

Braxton, Henry G., Jr., to Ethyl Corporation. Chemical composition. 4,509,952, Cl. 44-57.000.

Breidenbach, Heribert; and Strauss, Udo, to Steag AG. Process for cleaning of flue gases of a power plant with the aid of a coal dust burning flame and apparatus for carrying out the process. 4,509,437, Cl. 110-345.000.

Breitman, Daniel S.; and Langenegger, Henrique, to Pratt & Whitney Canada Inc. Inertial particle separator. 4,509,962, Cl. 55-306.000.

Brennan, Edward J.; and Pratt, John H., Jr., to PTC Aerospace Inc. Self-deploying legrest assembly. 4,509,795, Cl. 297-434.000.

Bresson, Clarence R.: *See—*
Parlman, Robert M.; Bresson, Clarence R.; and Young, Tommy L., 4,510,050, Cl. 209-167.000.

Breston, Michael P. Gravity-actuated thermal engines. 4,509,329, Cl. 60-531.000.

Bretts, Gerald R.: *See—*
Anderson, Philip M., III; Bretts, Gerald R.; and Kearney, James E., 4,510,489, Cl. 340-572.000.
Anderson, Philip M., III; Kearney, James E.; and Bretts, Gerald R., 4,510,490, Cl. 340-572.000.

Breuser, Erich; Grozinger, Wilhelm; Latsch, Reinhard; and Wurfel, Gernot, to Robert Bosch GmbH. Spark-plug assembly for internal-combustion engine. 4,509,476, Cl. 123-266.000.

Brew, James K.: *See—*
Miranti, Joseph P., Jr.; and Brew, James K., 4,509,933, Cl. 474-93.000.

Bridges, Charles D.: *See—*
Milberger, Lionel J.; and Bridges, Charles D., 4,509,594, Cl. 166-208.000.

Bridgestone Tire Company Limited: *See—*
Azuma, Yusaku; Kitayama, Yoshifumi; and Kawaida, Shinji, 4,510,011, Cl. 156-407.000.
Kawaida, Shinji; Okitsu, Yoshio; and Ikeda, Kazunari, 4,510,012, Cl. 156-415.000.

Brilando, Frank P., to Schwinn Bicycle Company. Bicycle chain hangar. 4,509,767, Cl. 280-289.00R.

Briner, Emil; and Hieronymi, Richard, to Rieter Machine Works Limited. False twist unit. 4,509,322, Cl. 57-333.000.

Brister, Beryle D. Apparatus for inserting a flexible bag into a fluid transmission line. 4,509,343, Cl. 62-514.00R.

Bristol-Myers Company: *See—*
Crenshaw, Ronnie R.; and Algieri, Aldo A., 4,510,309, Cl. 546-194.000.

British Petroleum Company p.l.c., The: *See—*
Brookes, David A., 4,509,546, Cl. 137-74.000.
Jorgensen, Pierre, 4,509,326, Cl. 60-39.182.
Joyner, Richard W.; McCarroll, John J.; and Tennison, Stephen R., 4,510,071, Cl. 252-373.000.

Brodie, Alastair C.: *See—*
Strachan, William S.; and Brodie, Alastair C., 4,510,312, Cl. 548-194.000.

Bronner, James A.; Moore, John D.; and Dale, Paul R., to Sanitek Products, Inc. Drift control concentrate. 4,510,081, Cl. 252-603.000.

Brooker, Lenon G., to Westinghouse Electric Corp. Release sheets for laminates with wax and alginate salt release layer. 4,510,199, Cl. 428-248.000.

Brookes, David A., to British Petroleum Company p.l.c., The. Firesafe seal. 4,509,546, Cl. 137-74.000.

Broszat, Gottfried, to Transformatoren Union Aktiengesellschaft. Disk coil winding of interwound single or double coils. 4,510,475, Cl. 336-60.000.

Brown, Alvin E., to Manning Technologies, Inc. Calibration circuit for ultrasonic flowmeter. 4,509,373, Cl. 73-861.280.

Brown, Arthur E. Reciprocating machines with both primary and secondary counter rotating balancers. 4,509,378, Cl. 74-44.000.

Brown, Charles E., to Medical College of Wisconsin, Inc., The. Apparatus and assay method for the quantitative determination of mineral content in bone. 4,510,450, Cl. 324-321.000.

Brown, Mary-Catherine: *See—*
Duke, June T.; Samuels, Kenneth E.; and Brown, Mary-Catherine, 4,510,204, Cl. 428-463.000.

Brown, Steven L.: *See—*
Mullally, Charles J.; Brown, Steven L.; Anderson, David L.; and Hitchcock, Robert F., 4,509,340, Cl. 62-503.000.

Browning, Jess. Bolt together conveyor structure. 4,509,637, Cl. 198-472.000.

Brugger, Franz: *See—*
Solleder, Friedrich; Krohn, Hellmut; Burckhardt, Manfred; and Brugger, Franz, 4,509,802, Cl. 303-110.000.

Brundin, Jan-Olof, to Medline AB. Occlusion of body channels. 4,509,504, Cl. 128-1.00R.

Brune, John F., to United States of America, Army. Aircraft shorted loop antenna with impedance matching and amplification at feed point. 4,510,500, Cl. 343-708.000.

Brunswick Corporation: *See—*
Councilman, Richard R.; Swisher, Steven L.; and Carpenter, Robert L., 4,509,705, Cl. 242-84.21R.
Slattery, Gordon C., 4,509,472, Cl. 123-179.00G.

Bryan, Horace. Electrode apparatus. 4,509,535, Cl. 128-798.000.

Bryan, Virginia M.: *See—*
Parks, David R.; Bryan, Virginia M.; and Herzenberg, Leonard A., 4,510,244, Cl. 435-172.200.

Bryson, Bruce A.; and Buschur, Jeffrey J., to General Motors Corporation. Windshield wiper transmission. 4,509,878, Cl. 403-71.000.

Bucher, Charles A.: *See—*
Bickley, Robert H.; Bucher, Charles A.; and Yee, David M., 4,510,472, Cl. 333-262.000.

Buchheister, Sue; and Poulson, Ann. Method of using ski training halter. 4,509,921, Cl. 434-253.000.

Budrean, John D.; and Kirkpatrick, John A., to Verson Allsteel Press Co. Method and apparatus for drawing heavy wall shells. 4,509,356, Cl. 72-349.000.

Budzik, Gerald P.: *See—*
Donahoe, Patricia K.; Budzik, Gerald P.; and Swann, David A., 4,510,131, Cl. 424-105.000.

Bugaj, Joseph E.: *See—*
Grogg, Terry W.; Bugaj, Joseph E.; and Bates, Paul E., 4,510,125, Cl. 424-1.100.

Bunkenburg, Joachim: *See—*
Smythe, Robert A.; Bunkenburg, Joachim; and Richardson, Gunnar D., 4,509,858, Cl. 356-358.000.

Burckhardt, Manfred: *See—*
Sollieder, Friedrich; Krohn, Hellmut; Burckhardt, Manfred; and Brugger, Franz, 4,509,802, Cl. 303-110.000.

Burmester, Alan F.: *See—*
Cleereman, Kenneth J.; Raspor, O. Carl; and Burmester, Alan F., 4,510,108, Cl. 264-119.000.

Burn, Ian, to Sprague Electric Company. Newtonian ceramic slip and process for using. 4,510,175, Cl. 427-79.000.

Burroughs Corporation: *See—*
Braun, Robert E.; and Benasutti, John E., 4,510,446, Cl. 324-158.00R.
Catiller, Robert D., 4,510,603, Cl. 371-21.000.
Faultersack, David D., 4,510,553, Cl. 361-413.000.
Harvey, Edgar L., 4,510,417, Cl. 313-585.000.

Bursh, Talmage P., Jr.; Davis, Dean I.; Slominski, John T.; and Swartz, Raymond K., to AT&T Bell Laboratories; and AT&T Technologies, Inc. Shielded cable. 4,510,346, Cl. 174-36.000.

Buschur, Jeffrey J.: *See—*
Bryson, Bruce A.; and Buschur, Jeffrey J., 4,509,878, Cl. 403-71.000.

Bux, Werner K.; Keller, Heinrich J.; and Mueller, Hans R., to International Business Machines Corp. Method and arrangement for local address acquisition by a station in a communication system. 4,510,493, Cl. 340-825.050.

C. E. Shepherd Company, Inc.: *See—*
Shepherd, C. Barrett, 4,509,288, Cl. 43-102.000.

C F Braun & Co.: *See—*
Grotz, Bernard J., 4,510,123, Cl. 423-360.000.

C.W.F. Hamilton & Company Limited: *See—*
Turnbull, Robert S., 4,509,923, Cl. 440-43.000.

Cadena, Edward R.: *See—*
Kruka, Vitold R.; Kipp, Robert M.; and Cadena, Edward R., 4,510,588, Cl. 367-165.000.

Cais, Michael; and Shimoni, Moshe, to Technion Research & Development Foundation, Ltd. Method for a new type of chromatography and device therefor. 4,510,058, Cl. 210-657.000.

Calgon Corporation: *See—*
Amjad, Zahid; and Yorke, Monica A., 4,510,059, Cl. 210-701.000.

California Institute of Technology: *See—*
Rowlette, John J., 4,510,219, Cl. 429-212.000.

Callaert, Andre : *See—*
Van Raemdonck, Rene ; and Callaert, Andre , 4,509,785, Cl. 294-118.000.

Camlibel, Irfan; and Chin, Aland K., to AT&T Bell Laboratories. Ohmic contacts for semiconductor devices. 4,510,514, Cl. 357-17.000.

Cammarata, Edward. Soldering station with automatic dross removal. 4,509,670, Cl. 228-34.000.

Camodeca, Ernest J.: *See—*
Wright, Dennis C.; and Camodeca, Ernest J., 4,509,717, Cl. 251-144.000.

Canadian Liquid Air Ltd/Air Liquide: *See—*
Savard, Guy; and Lee, Robert G. H., 4,509,595, Cl. 166-261.000.

Canadian Patents & Development Limited: *See—*
Inculet, Ion I.; and Hodgson, Kenneth J., 4,509,694, Cl. 239-697.000.
Szabo, Ervin I.; and Whiting, Laurence V., 4,509,983, Cl. 106-38.200.

Canon Kabushiki Kaisha: *See—*
Fukui, Hiroshi, 4,510,505, Cl. 346-76.0PH.
Ikemori, Keiji, 4,509,833, Cl. 350-427.000.
Ishikawa, Yuji, 4,510,507, Cl. 346-76.0PH.
Katsuma, Makoto; Hiramatsu, Akira; Arakawa, Kazuhiko; and Murakami, Hiroyasu, 4,509,848, Cl. 354-473.000.
Maeda, Masaya, 4,510,534, Cl. 360-10.300.
Momiyama, Kikuo, 4,509,849, Cl. 354-479.000.
Sakai, Shinji; and Kawabata, Takashi, 4,509,841, Cl. 354-400.000.
Terasawa, Koji, 4,510,510, Cl. 346-140.00R.
Tezuka, Nobuo, 4,509,240, Cl. 29-227.000.

Card, David C.: *See—*
Boudreaux, Harry J.; Card, David C.; and Hanson, Bernard M., 4,509,600, Cl. 166-381.000.

Carella, Richard F. Method for making arrow fletching. 4,510,109, Cl. 264-451.000.

Carganico, Germano: *See—*
Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, 4,510,149, Cl. 514-341.000.

Caridis, Andrew A.; Benson, Clark K.; and Klein, Lawrence F., to Heat and Control, Inc. Taco shell forming and cooking method. 4,510,165, Cl. 426-439.000.

Carl Manufacturing Co., Ltd.: *See—*
Mori, Chuzo; Watanabe, Jun; and Kudo, Katsutaka, 4,509,397, Cl. 83-453.000.

Carl Schmale KG: *See—*
Freermann, Johannes, 4,509,440, Cl. 112-153.000.

Carl-Zeiss-Stiftung: *See—*
Leitz, Helmut, 4,509,269, Cl. 33-293.000.

Carl-Zeiss-Stiftung, Heidenheim/Brenz: *See—*
Herzog, Klaus; and Szenger, Franz, 4,509,871, Cl. 384-502.000.

Carlson, Franklin B.; and Hall, Robert N., to Tosco Corporation. Circulating bed heat exchanger for cooling shale ash. 4,509,589, Cl. 165-95.000.

Carney, George T.; and Heath, Gary C., to Energy Control Products, Inc. Energy management control system. 4,509,585, Cl. 165-12.000.

Carpenter, James H.; and Corderman, Donald G., to Kennecott Corporation. Vane retention apparatus for abrasive blasting machine. 4,509,300, Cl. 51-435.000.

Carpenter, Robert L.: *See—*
Councilman, Richard R.; Swisher, Steven L.; and Carpenter, Robert L., 4,509,705, Cl. 242-84.21R.

Carr, Arthur E.: *See—*
Erlam, David P.; and Carr, Arthur E., 4,509,810, Cl. 339-17.00M.

Carrier Corporation: *See—*
Wellman, Donald C., 4,509,371, Cl. 73-861.000.

Carroll, Noel; and Phelps, Colin J., to Secton Pty. Ltd. Motor lock device. 4,510,405, Cl. 310-76.000.

Carter, Russell P., Jr., to Mobay Chemical Corporation. Polycarbonate compositions containing powdered sulfates. 4,510,196, Cl. 428-220.000.

Carver, Robert J.: *See—*
Welsch, John H.; Chapko, John J.; and Carver, Robert J., 4,509,805, Cl. 312-210.000.

Casio Computer Co., Ltd.: *See—*
Tahara, Iwao, 4,510,485, Cl. 340-323.00R.

Caslavsky, Jaroslav L.; Lavoie, Gerald H.; Earle, William H.; and Viechnicki, Dennis J., to United States of America, Army. Furnace for vertical solidification of melt. 4,510,609, Cl. 373-110.000.

Castiglione, Frank J. Drive attachment for J-hook. 4,509,393, Cl. 81-121.00A.

Caterpillar Tractor Co.: *See—*
Melocik, Kurt B., 4,509,406, Cl. 91-453.000.

Catiller, Robert D., to Burroughs Corporation. Testing system for reliable access times in ROM semiconductor memories. 4,510,603, Cl. 371-21.000.

Catto, Alberto: *See—*
Nardi, Dante; Catto, Alberto; Tajana, Alberto; Cazzulani, Pietro; and Graziani, Gabriele, 4,510,140, Cl. 544-360.000.

Caugant, Jean; and Dale, Jacques, to Thomson-CSF. Diaphragm for defining a radiation beam. 4,510,613, Cl. 378-152.000.

Caulfield, H. John: *See—*
Mueller, Peter F.; and Caulfield, H. John, 4,510,575, Cl. 364-518.000.

Cazzulani, Pietro: *See—*
Nardi, Dante; Catto, Alberto; Tajana, Alberto; Cazzulani, Pietro; and Graziani, Gabriele, 4,510,140, Cl. 544-360.000.

Celamerck GmbH & Co. KG: *See—*
Mengel, Rudolf; Schroder, Ludwig; Stransky, Werner; Linden, Gerbert; Schneider, Gerhart; and Lust, Sigmund, 4,509,972, Cl. 71-92.000.

Centocor, Inc.: *See—*
Hevey, Richard C., 4,510,119, Cl. 422-71.000.

Centre National d'Etudes Spatiales: *See—*
Vermande, Paul, 4,509,857, Cl. 356-346.000.

Cerberus AG: *See—*
St. Jean, Herbert N.; and Settanni, Richard, 4,510,488, Cl. 340-567.000.

Chalmers, Stephen P. Temperature/time limit indicator. 4,509,449, Cl. 116-218.000.

Championship Electronics (USA) Inc.: *See—*
Yeh, Gregory Y. S., 4,509,383, Cl. 74-471.0XY.

Chandra, Rangasami S.: *See—*
Eineichner, Donald E.; Chandra, Rangasami S.; and Tucci, James M., 4,509,365, Cl. 73-151.000.

Chang, Chieh; and Lee, Man S., to GTE Lenkurt Incorporated. Switched capacitor SSB modulator. 4,510,466, Cl. 332-31.00R.

Chang, Chieh; and Lee, Man S., to GTE Communication Systems Corporation. Switched capacitor DSB modulator/demodulator. 4,510,467, Cl. 332-31.00R.

Chang, Philip Y.; and McInroy, John W., to International Business Machines Corp. Qualifying and sorting file record data. 4,510,567, Cl. 364-300.000.

Chang, Robert W. H., to Minnesota Mining and Manufacturing Company. Compositions and method for reducing elution of therapeutic agents from teeth. 4,510,127, Cl. 424-52.000.

Chant, Patrick: *See—*
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,510,080, Cl. 252-522.00R.

Chapko, John J.: *See—*
Welsch, John H.; Chapko, John J.; and Carver, Robert J., 4,509,805, Cl. 312-210.000.

Charbonnages de France: *See—*
Simone, Pregermain; Henri, Charcosset; and Michele, Andres, 4,510,039, Cl. 208-10.000.

Chatanooga Corporation: *See—*
Lie, Hakon, 4,509,743, Cl. 272-97.000.

Cheatham, James S. Versatile plurality mixer with rapid chance lot cycling and locking means. 4,509,755, Cl. 273-144.00B.

Cheetham, Ivan C.; and Pope, George A., to Dunlop Limited. Fire-barriers. 4,509,559, Cl. 138-121.000.

Chemet Corporation: *See—*
Jost, Ernest M., 4,509,980, Cl. 75-234.000.
Jost, Ernest M., 4,509,980, Cl. 75-234.000.

Chemfix Technologies, Inc.: *See—*
Donaldson, David L., 4,509,696, Cl. 241-15.000.

Chemical Research & Licensing Company: *See—*
Hearn, Dennis, 4,510,336, Cl. 568-697.000.

Chemie Linz Aktiengesellschaft: *See—*
Stern, Gerhard, 4,510,099, Cl. 260-465.50R.

Chemiefaser Lenzing Aktiengesellschaft: *See—*
Schonberger, Johann; Bloo, Johann; Mistlberger, Bruno; and Gehmaier, Johann, 4,509,562, Cl. 139-13.00R.

Chemplex Company: *See*—
Lynch, Michael W.; and Pullukat, Thomas J., 4,510,299, Cl. 526-129.000.
Chenoweth, David V.; and McStravick, David M., to Baker Oil Tools, Inc. Gas well liquid removal system and process. 4,509,599, Cl. 166-370.000.
Chervitz, Melvin. Fever thermometer. 4,509,533, Cl. 128-736.000.
Chesnut, M. Gaines. Cartridge clip. 4,509,283, Cl. 42-50.000.
Chevron Research Company: *See*—
Kuehler, Christopher W., 4,510,038, Cl. 208-10.000.
Zones, Stacey I., 4,510,256, Cl. 502-62.000.
Chi, Jim-Yong; and Holmstrom, Roger P., to GTE Laboratories. Method of fabricating submicron silicon structures such as permeable base transistors. 4,510,016, Cl. 156-643.000.
Chianelli, Russell R.: *See*—
Stiefel, Edward I.; Pan, Wie-Hin; and Chianelli, Russell R., 4,510,260, Cl. 502-219.000.
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Satoh, Akihiro, to Chisso Corporation. Ethylene-propylene copolymers for foaming and process for producing the same. 4,510,292, Cl. 525-247.000.
Chicago Bridge & Iron Company: *See*—
Ludwigsen, John S.; Ludwigsen, Jill L.; and Gallagher, Terry A., 4,509,344, Cl. 62-76.000.
Chin, Aland K.: *See*—
Camlibel, Irfan; and Chin, Aland K., 4,510,514, Cl. 357-17.000.
Chiolle, Antonio; Vecchi, Alfio; and Credali, Lino, to Montedison S.p.A. Process for the surface modification of synthetic fibers. 4,510,185, Cl. 427-222.000.
Chiron Corporation: *See*—
Cousens, Lawrence S.; Bell, Graeme I.; and Valenzuela, Pablo D. T., 4,510,245, Cl. 435-172.300.
Chisholm, John P.; and Morgan, Donald G., to Vega Precision Laboratories, Inc. TACAN' data link system. 4,510,499, Cl. 343-456.000.
Chisso Corporation: *See*—
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Satoh, Akihiro, 4,510,292, Cl. 525-247.000.
Chiu, Tony T.; Coatney, Charles W.; and Hirahara, Katsuji, to Magnuson Corporation. Stemming and peeling apparatus. 4,509,414, Cl. 99-585.000.
Chou, Kechia J.; and Valkovich, Phillip B., to Texaco Inc. Amine-polymer dispersants in lubricating oils and a method of improving the dispersancy of a lubricating oil. 4,510,063, Cl. 252-51.50R.
Chow, Edmund E., to Reed Industries, Inc. Electronic coin validator with improved diameter sensing apparatus. 4,509,633, Cl. 194-100.00A.
Christenson, Philip A.: *See*—
Willis, Brian J.; Eilerman, Robert G.; Christenson, Philip A.; and Yurecko, John M., Jr., 4,510,319, Cl. 560-231.000.
Chrysler Corporation: *See*—
Krowl, William G., 4,509,358, Cl. 72-476.000.
Chu, Kuo-Chin. Electromagnetically-induced rocking clock. 4,509,865, Cl. 368-134.000.
Ciba Geigy AG: *See*—
Kingston, Samuel B.; and Evans, Graham, 4,510,238, Cl. 430-627.000.
Kingston, Samuel B.; and Evans, Graham, 4,510,238, Cl. 430-627.000.
Plattner, Eric; Staubli, Sebastian; and von Kaenel, Fred, 4,510,100, Cl. 260-508.000.
Ciba-Geigy Corporation: *See*—
Heckendorn, Roland, 4,510,141, Cl. 514-250.000.
Khanna, Satish C., 4,510,128, Cl. 424-79.000.
Kirchmayr, Rudolf; and Rutsch, Werner, 4,510,290, Cl. 525-162.000.
Meyer, Willy; and Fury, Werner, 4,510,325, Cl. 564-89.000.
Mockli, Peter, 4,510,088, Cl. 260-380.000.
Cisko, Lawrence W.: *See*—
Martin, Robert J.; Cisko, Lawrence W.; and Turley, Bernard C., 4,510,033, Cl. 204-245.000.
Citizen Watch Company Limited: *See*—
Kurihara, Toshio; Kunita, Masao; Yasunaga, Makoto; Masuda, Katuya; Moriya, Takashi; and Oosawa, Seiichi, 4,509,421, Cl. 101-93.040.
Civitani, Renzo: *See*—
Ronconi, Mario; and Civitani, Renzo, 4,509,868, Cl. 374-141.000.
Clark, Thomas S.; and Kennedy, William S. Passive temperature control shipment container. 4,509,587, Cl. 165-61.000.
Clark, William J. Apparatus for the orthodontic treatment of teeth. 4,509,918, Cl. 433-5.000.
Clatterbuck, Carroll H.; and Ruitberg, Arthur P., to United States of America, National Aeronautics and Space Administration. High voltage isolation transformer. 4,510,476, Cl. 336-84.00C.
Claudius Peters AG: *See*—
Ubert, Hans-Jurgen, 4,509,917, Cl. 432-75.000.
Clausen, Erik; and Clausen, Johannes, to Scan Screen A/S. Transparent rear projection screen. 4,509,822, Cl. 350-128.000.
Clausen, Johannes: *See*—
Clausen, Erik; and Clausen, Johannes, 4,509,822, Cl. 350-128.000.
Cleary, James W.; Sherk, Fred T.; and Nesheiwat, Afif M. Purification of N-methylpyrrolidone. 4,510,316, Cl. 548-555.000.
Cleereman, Kenneth J.; Raspor, O. Carl; and Burmester, Alan F., to Dow Chemical Company, The. Method of forming blanks for the solid-phase forming of thermoplastic articles. 4,510,108, Cl. 264-119.000.
Clerc, Jean F.; and Robert, Jacques, to Commissariat a l'Energie Atomique. Matrix display device with multiple screen electrodes. 4,509,828, Cl. 350-333.000.
Cleusix, Willy; and Nikles, Francois, to Ebauches Electroniques S.A. Electronic timepiece movement. 4,509,867, Cl. 368-321.000.
Cloutier, Richard; and Vissani, Carlo. Portable liquid measuring and dispensing device. 4,509,659, Cl. 222-41.000.
Coathylene S.A.: *See*—
Korsgen, Hans H.; and Weller, Wolfgang, 4,510,305, Cl. 528-494.000.
Coatney, Charles W.: *See*—
Chiu, Tony T.; Coatney, Charles W.; and Hirahara, Katsuji, 4,509,414, Cl. 99-585.000.
Coats & Clark, Inc.: *See*—
McKibben, Jerry, 4,509,399, Cl. 84-216.000.
Cobb, Raymond L., to Phillips Petroleum Company. Process for production of 1,1-dimethyl-6-hydroxyindans. 4,510,337, Cl. 568-734.000.
Cockayne, Brian; Griffiths, Richard J. M.; and Wright, Peter J., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Organometallic chemical vapor deposition of films utilizing organic heterocyclic compounds. 4,509,997, Cl. 148-175.000.
Cockburn, Harrold; Weatherly, Darrel; and Yarbro, Earl, to Bell Manufacturing Company. Cylinder oiler assembly. 4,509,468, Cl. 123-90.380.
Coffman, Randall R.; and Mitchell, James E., to Norman Dryer Company, Inc. Dryer having top pivot for tumbler. 4,509,275, Cl. 34-126.000.
Cogelia, Nicholas J.: *See*—
Arroyo, Candido J.; Cogelia, Nicholas J.; and Darsey, Ralph J., 4,510,348, Cl. 174-121.00A.
Cohen, Ilan: *See*—
Spector, Yehiel; and Cohen, Ilan, 4,509,601, Cl. 169-61.000.
Cohen, Paul B., to Prime Computer, Inc. High speed buffer allocation apparatus. 4,510,581, Cl. 364-900.000.
Colautti, Albert J.; and Borlinghaus, Hans J., to General Motors Corporation. Preloaded screw actuator. 4,509,382, Cl. 74-424.80R.
Cole, Joycene L. Cryptographic game apparatus and mode of play. 4,509,758, Cl. 273-240.000.
Coleman, James H., to Upjohn Company, The. Treatment of panic disorders with adinazolam. 4,510,153, Cl. 514-220.000.
Coles Cranes Limited: *See*—
Thomasson, William R., 4,509,376, Cl. 73-862.560.
Colgate-Palmolive Company: *See*—
Saar, David C., 4,510,066, Cl. 252-140.000.
Colleen Pencil Co., Ltd.: *See*—
Shintani, Koichi, 4,509,875, Cl. 401-34.000.
Collins, David R.: *See*—
Morris, Horton H.; Whyte, John R., Jr.; Forbus, Ellen; Dentan, Catherine M.; and Collins, David R., 4,510,254, Cl. 501-146.000.
Collins, George J.; Thompson, Lance R.; Rocca, Jorge J.; and Boyer, Paul K., to Colromm, Inc. Electron beam induced chemical vapor deposition. 4,509,451, Cl. 118-50.100.
Colromm, Inc.: *See*—
Collins, George J.; Thompson, Lance R.; Rocca, Jorge J.; and Boyer, Paul K., 4,509,451, Cl. 118-50.100.
Colt Industries Operating Corp: *See*—
Johnson, Kalin S., 4,509,483, Cl. 123-432.000.
Combustion Engineering, Inc.: *See*—
Felice, Frank T.; and Yonushonis, Celeste B., 4,510,253, Cl. 501-95.000.
Kuljis, Zoran; and Lareau, John P., 4,509,369, Cl. 73-628.000.
Commissariat a l'Energie Atomique: *See*—
Allemand, Robert; and Laval, Michel, 4,510,394, Cl. 250-483.100.
Andrie, Philippe; and Mimeur, Jacques, 4,509,263, Cl. 33-169.00R.
Clerc, Jean F.; and Robert, Jacques, 4,509,828, Cl. 350-333.000.
Guittet, Jack; Marchal, Paul; Micaelli, Alain; and Vertut, Jean, 4,510,574, Cl. 364-513.000.
Commonwealth of Australia, The: *See*—
Whiting, James F.; and Koch, Rolf H. L., 4,509,368, Cl. 73-624.000.
Compagnie Industrielle Des Telecommunications Cit-Alcatel: *See*—
Delpit, Philippe; Duplessis, Philippe; and Renaudin, Yves, 4,510,601, Cl. 370-110.300.
Compagnie Internationale pour l'Informatique CII-Honeywell Bull: *See*—
Lazzari, Jean-Pierre, 4,510,544, Cl. 360-114.000.
Comper, Louis F.: *See*—
Scheiderich, Robert F.; and Comper, Louis F., 4,509,984, Cl. 106-38.220.
Computer Basic Technology Research Assoc.: *See*—
Yoshida, Shigemasa; and Araki, Ichiro, 4,510,537, Cl. 360-78.000.
Cones, Charles F. Exercise bicycle. 4,509,742, Cl. 272-73.000.
Conover, Michael S., to Welding, K. C. MIG Welding gun. 4,509,247, Cl. 29-527.400.
Consolidation Coal Company: *See*—
May, Francis A.; and Patts, Larry, 4,510,352, Cl. 191-64.000.
Continental Gummi-Werke Aktiengesellschaft: *See*—
Funk, Heinrich; Pakur, Henryk; and Seitz, Hans, 4,509,575, Cl. 152-356.00R.
Cook, John, to Graves, J. W.; and Tate, Harold, Jr., part interest to each. Fluid actuated switch. 4,510,358, Cl. 200-81.00R.
Cooper, David C.; and Bouchard, Kenneth J., to Stelco Inc. Prevailing torque nut. 4,509,220, Cl. 10-86.00A.
Cooper, Kelvin: *See*—
Richardson, Kenneth; and Cooper, Kelvin, 4,510,148, Cl. 514-340.000.

Cooper, Merton G.; Kerns, William R.; Filley, Daniel E.; and Koschnick, Gary A., to United States of America, Navy. Hydraulic powered gate valve. 4,509,549, Cl. 137-327.000.

Cooper, Ralph M.; and Mena, Walter M., to AMP Incorporated. Cable clamp. 4,509,710, Cl. 248-73.000.

Corbett, Warren J. Food container. 4,509,653, Cl. 215-231.000.

Corderman, Donald G.: *See—*
Carpenter, James H.; and Corderman, Donald G., 4,509,300, Cl. 51-435.000.

Cornelius Company, The: *See—*
Austin, Forrest L.; and Bebeau, Jerald R., 4,509,690, Cl. 239-429.000.

Cornell Research Foundation, Inc.: *See—*
Sigrimis, Nick A.; and Scott, Norman R., 4,510,495, Cl. 340-825.540.

Cornely, Wolfgang; Esser, Heinz; and Schmidt, Rudolf, to Bergwerksverband GmbH. Method of coating geological formations as well as air- and fire barriers. 4,510,180, Cl. 427-136.000.

Cornils, Boy; Tihanyi, Bela; Weber, Jurgen; DeWin, Werner; Erben, Edwin; and Muhlratzer, August, to Ruhrchemie Aktiengesellschaft; and Maschinenfabrik Augsburg-Nurnberg. Method for the production of homogeneous coatings of two or more metals and/or metal compounds. 4,510,182, Cl. 427-162.000.

Corning Glass Works: *See—*
Prindle, William A., 4,509,651, Cl. 211-70.600.

Cosentino, Roberto F.; and Bonapace, Franco, to Pharmindev Limited. Process and apparatus for electrostatic coating of poorly conductive or non-conductive products. 4,510,170, Cl. 427-33.000.

Costa, Armando; and Morbin, Federico, to Ing. C. Olivetti & C., S.p.A. Screen for electrical circuits. 4,510,345, Cl. 174-35.00R.

Costello, Peter E.; Fossett, Lawrence D.; Lane, Michael S.; Quin, Terrence T.; and Smith, Nicholas K., to AT&T Bell Laboratories. ACD Management information system. 4,510,351, Cl. 179-27.00D.

Costello, Samuel J.; and Sohne, Eric R., to Allied Corporation. Apparatus for crimping brush contacts. 4,509,255, Cl. 29-753.000.

Costruzioni Meccaniche G. Mazzoni S.p.A.: *See—*
Mazzoni, Aldo, 4,510,110, Cl. 264-176.00R.

Coulter Electronics, Inc.: *See—*
Auer, Robert, 4,510,438, Cl. 324-71.400.

Coulter Systems Corporation: *See—*
Kuehnle, Manfred R.; Martinez, Ferdinand; Runyan, I. V.; and Barry, Carol M. F., 4,510,223, Cl. 430-44.000.
Kuehnle, Manfred R.; and Martinez, Ferdinand, 4,510,225, Cl. 430-126.000.

Councilman, Richard R.; Swisher, Steven L.; and Carpenter, Robert L., to Brunswick Corporation. Surfcasting spinning reel. 4,509,705, Cl. 242-84.21R.

Cousens, Lawrence S.; Bell, Graeme I.; and Valenzuela, Pablo D. T., to Chiron Corporation. Adenovirus promoter system. 4,510,245, Cl. 435-172.300.

Cousse, Henry; Mouzin, Gilbert; Tarayre, Jean-Pierre; and Rieu, Jean-Pierre, to Pierre Fabre S.A. Derivatives of biphenyl alkyl carboxylates and their use as medicaments. 4,510,142, Cl. 514-255.000.

Coutta, John M.; and Van Dusen, Paul A. Surveillance system. 4,510,526, Cl. 358-108.000.

Coveleskie, Richard A.; and Lee, Shung-Yan L., to Du Pont de Nemours, E. I., and Company. Photopolymerizable compositions and elements containing acid to reduce scum and stain formation. 4,510,230, Cl. 430-273.000.

Cowen, Steven J.; and Young, Christopher M., to United States of America, Navy. Reproducible standard for aligning fiber optic connectors which employ graded refractive index rod lenses. 4,509,827, Cl. 350-320.000.

Cowen, Steven J.: *See—*
Garcia, Graham A.; and Cowen, Steven J., 4,510,607, Cl. 372-49.000.

Cox, Ron; and Pettovello, Elzi. Control for welding system. 4,510,373, Cl. 219-137.710.

Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, to Farmitalia Carlo Erba S.p.A. N-Imidazolyl derivatives containing naphthalene or indene nucleus. 4,510,149, Cl. 514-341.000.

Cragoe, Edward J., Jr.: *See—*
Blaine, Edward H.; Cragoe, Edward J., Jr.; Hirschmann, Ralph F.; Nancarrow, John F., deceased; Nancarrow, Elisabeth M., executrix; and Tobert, Jonathan A., 4,510,322, Cl. 514-255.000.

Creative Research & Development, Inc.: *See—*
Nezat, Jerry W., 4,510,162, Cl. 426-124.000.

Credali, Lino: *See—*
Chiolle, Antonio; Vecchi, Alfio; and Credali, Lino, 4,510,185, Cl. 427-222.000.

Creissels, Denis C. Twin suspension/haulage cable gondola lift. 4,509,430, Cl. 104-173.00R.

Crenshaw, Ronnie R.; and Algieri, Aldo A., to Bristol-Myers Company. Histamine H_2-antagonists. 4,510,309, Cl. 546-194.000.

Crosby, John, to Imperial Chemical Industries PLC. Insecticidal product. 4,510,098, Cl. 260-465.00D.

Croswhite, Howard L.: *See—*
Vahratian, Adam; Maynard, Roosevelt, Jr.; Croswhite, Howard L.; and Liang, Po-Lung, 4,509,389, Cl. 74-695.000.

Crouse, Dennis N.; Reynolds, James C.; and Walsh, Fraser M., to Tracer Technologies, Inc. Electrode with electron transfer catalyst. 4,510,214, Cl. 429-43.000.

CTS Corporation: *See—*
Barber, Michael; and Lloyd, Charles F., 4,509,716, Cl. 251-141.000.

Culp, Charles H.; and Downar, Denise J., to Honeywell Inc. Add/shed load control according to multiple add/shed sequences. 4,510,398, Cl. 307-35.000.

Curran, John: *See—*
Holland, Frank S.; Womersley, Peter; and Curran, John, 4,510,095, Cl. 260-429.700.

Currie, Janie K.; and Mooney, J. Robert, to Standard Oil Company, The. High viscosity index synthetic oils and synthesis thereof. 4,510,342, Cl. 585-524.000.

Curtis, Huntington W.; Dodge, Frederick A.; Francis, David B.; and Mizzi, John V., to International Business Machines Corporation. System for plotting a miniature ECG. 4,509,530, Cl. 128-710.000.

Cusack, Robert F., to GTE Valeron Corporation. Touch probe. 4,509,266, Cl. 33-174.00L.

Cushing, Donald S., to General Electric Company. Multiple spray distribution system for a domestic dishwasher. 4,509,687, Cl. 239-245.000.

Cuthbert, John D.; and Soos, Nicholas A., to AT&T Bell Laboratories. Removal of coating from periphery of a semiconductor wafer. 4,510,176, Cl. 427-82.000.

Dagostino, Thomas P.; and Trudel, John D., to Tektronix, Inc. Waveform storage and display system. 4,510,571, Cl. 364-487.000.

Dai Nippon Insatsu Kabushiki Kaisha: *See—*
Moriguchi, Yutaro; Honda, Makoto; and Izawa, Akira, 4,509,823, Cl. 350-128.000.

Daiichi Dentsu Kabushiki Kaisha: *See—*
Doniwa, Tabito, 4,510,424, Cl. 318-432.000.

Daimler-Benz Aktiengesellschaft: *See—*
Forster, Hans-Joachim; Lubbing, Bernd-Eric; and Letsche, Ulrich, 4,509,488, Cl. 123-481.000.
Solleder, Friedrich; Krohn, Hellmut; Burckhardt, Manfred; and Brugger, Franz, 4,509,802, Cl. 303-110.000.

Dainichi-Nippon Cables, Ltd.: *See—*
Tanno, Shogo, 4,510,435, Cl. 324-52.000.

Dainichi Seika Color & Chemicals Mfg. Co., Ltd.: *See—*
Kuriyama, Katsumi; Kondo, Isao; and Misaizu, Iwao, 4,510,186, Cl. 427-381.000.

Dairy & Food Labs, Inc.: *See—*
Young, Randall S.; and Fredericks, Ronald D., Jr., 4,510,072, Cl. 252-380.000.

Dale, Jacques: *See—*
Caugant, Jean; and Dale, Jacques, 4,510,613, Cl. 378-152.000.

Dale, Paul R.: *See—*
Bronner, James A.; Moore, John D.; and Dale, Paul R., 4,510,081, Cl. 252-603.000.

Damrow, Paul A.; and Tsang, Floris Y., to Dow Chemical Company, The. Method for molybdenum-coated aluminum current collector for alkali metal/sulfur battery cells. 4,509,254, Cl. 29-623.500.

Daniels, Michael P., to Minnesota Mining and Manufacturing Company. Information disk of grooved, metal-coated crosslinked polymeric layer. 4,510,593, Cl. 369-283.000.

Dardis, Richard E., to Olin Corporation. Soda-anthraquinone lignin sacrificial agents in oil recovery. 4,509,597, Cl. 166-274.000.

Darsey, Ralph J.: *See—*
Arroyo, Candido J.; Cogelia, Nicholas J.; and Darsey, Ralph J., 4,510,348, Cl. 174-121.00A.

Da Silva, Evelyne: *See—*
Resneau, Jean C.; Puyhaubert, Jean; Da Silva, Evelyne; and Lamontagne, Claude, 4,510,470, Cl. 333-142.000.

Data I/O Corporation: *See—*
Reece, John M.; Martin, Robert G.; and Franzel, John R., 4,510,572, Cl. 364-489.000.

Davich, Luke J.; Erickson, Jack A.; and Proulx, Richard W., to Federal Cartridge Corporation. Shotshell casing with partially telescoped basewad. 4,509,428, Cl. 102-466.000.

David, Tom, to Tom David, Inc. Condiment grinder-dispenser. 4,509,698, Cl. 241-169.100.

Davidovits, Joseph; and Sawyer, James L., to Pyrament Inc. Early high-strength mineral polymer. 4,509,985, Cl. 106-84.000.

Davis, Dean I.: *See—*
Bursh, Talmage P., Jr.; Davis, Dean I.; Slominski, John T.; and Swartz, Raymond K., 4,510,346, Cl. 174-36.000.

Davis, Kevin M.; Wahl, Timothy M.; Beckman, John A.; and Isele, Karl J., Jr., to Nalco Chemical Company. Off-gas monitor for steel processes. 4,509,727, Cl. 266-44.000.

Davis, Toby L. Torque meter. 4,509,375, Cl. 73-862.320.

Dayco Corporation: *See—*
Foster, Randy C.; Hackard, Roger G.; and Wilson, Leslie B., 4,509,935, Cl. 474-138.000.
Miranti, Joseph P., Jr.; and Brew, James K., 4,509,933, Cl. 474-93.000.
Oliver, Larry R., 4,510,003, Cl. 156-137.000.
Woodland, Carl R., 4,509,938, Cl. 474-264.000.

De la Rue Giori S.A.: *See—*
Germann, Albrecht J., 4,509,424, Cl. 101-177.000.

de Broqueville, Axel. Transportation system utilizing a stretchable train of cars and stretchable bandconveyors. 4,509,429, Cl. 104-25.000.

de Calvino y Teijeiro, Ben J., to Westinghouse Electric Corp. Circuit interrupter having improved closing resistor control means. 4,510,359, Cl. 200-144.0AP.

Deflecta-Shield Corporation: *See—*
Parham, Fred, 4,509,588, Cl. 165-80.00R.

de Gruchy, Robert S.: *See—*
Govang, James A.; Mee, William W.; and de Gruchy, Robert S., 4,509,648, Cl. 211-70.600.

Degussa Aktiengesellschaft: *See*—
Beyer, Hans-Hermann; Baudis, Ulrich; and Biberbach, Peter, 4,509,993, Cl. 148-15.500.

Dekker, Lambert: *See*—
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,510,080, Cl. 252-522.00R.

Delfino, Allan B.: *See*—
McTamaney, Louis S.; Delfino, Allan B.; and Bisbee, Gary W., 4,509,901, Cl. 417-18.000.

Delpit, Philippe; Duplessis, Philippe; and Renaudin, Yves, to Compagnie Industrielle Des Telecommunications Cit-Alcatel. Digital frequency receiver. 4,510,601, Cl. 370-110.300.

Delta-X Corporation: *See*—
Eicher, Dean A.; and McKee, Fount E., 4,509,552, Cl. 137-557.000.

Demarne, Henri; and Wagnon, Jean, to Sanofi, S.A. 4[3-(1,1-Dimethyl-2-3(3-indolyl)ethylamino)-2-hydroxypropoxy]indole. 4,510,315, Cl. 548-455.000.

Demny, Florian C.: *See*—
Stewart, Thomas L.; and Demny, Florian C., 4,510,060, Cl. 210-746.000.

Dempster, Roy E.: *See*—
LeBrun, Thomas Q.; Torkelson, John; Dempster, Roy E.; and Van Tyne, Richard G., 4,510,619, Cl. 382-57.000.

den Hollander, Willem, to RCA Corporation. Horizontal deflection phasing arrangement. 4,510,527, Cl. 358-158.000.

Denki Kagaku Kogyo Kabushiki Kaisha: *See*—
Okazaki, Haruo; and Ohkubo, Takashi, 4,510,274, Cl. 523-411.000.
Tabata, Itsuo; and Watanabe, Seiichi, 4,510,341, Cl. 570-229.000.

Dennison Manufacturing Company: *See*—
Shuman, Ralph J., 4,510,206, Cl. 428-488.100.

Densmore, John C.; and Watkins, Charles W., to Tuftco Corporation. Clamp insert for tufting elements in narrow gauge tufting machine. 4,509,439, Cl. 112-79.00R.

Dentan, Catherine M.: *See*—
Morris, Horton H.; Whyte, John R., Jr.; Forbus, Ellen; Dentan, Catherine M.; and Collins, David R., 4,510,254, Cl. 501-146.000.

de Ruiter, Ernest: *See*—
Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest, 4,510,193, Cl. 428-196.000.

Desjardins, Francois G., to Electrohome Limited. Generation of vectors. 4,510,432, Cl. 320-1.000.

Desjardins, Stanley P.; and Warrick, James C., to Simula Inc. Variable-load energy absorber and method for making energy absorbers having variable-load capability. 4,509,621, Cl. 188-372.000.

Dessau, Ralph M., to Mobil Oil Corporation. Hydrocarbon dewaxing process using steam-activated alkali metal zeolite catalyst. 4,510,045, Cl. 208-111.000.

Detsch, Steven G. Oral electrical treatment apparatus and method. 4,509,519, Cl. 128-419.00F.

Dettfurth, Bernd: *See*—
Dettfurth, Karl; and Dettfurth, Bernd, 4,509,308, Cl. 52-787.000.

Dettfurth, Karl; and Dettfurth, Bernd, to Messerschmitt-Boelkow-Blohm GmbH. Mounting assembly and method for installing dowels in compound panels. 4,509,308, Cl. 52-787.000.

DeVries, James H., to DLP, Inc. Cardioplegia temperature indicator. 4,509,532, Cl. 128-736.000.

DeWin, Werner: *See*—
Cornils, Boy; Tihanyi, Bela; Weber, Jurgen; DeWin, Werner; Erben, Edwin; and Muhlratzer, August, 4,510,182, Cl. 427-162.000.

de Witt, Paolo: *See*—
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and de Witt, Paolo, 4,510,318, Cl. 560-147.000.

Dias, Donald R.; Guterman, Daniel C.; Proebsting, Robert J.; and Leuschner, Horst, to Mostek Corporation. MOS Random access memory cell with nonvolatile storage. 4,510,584, Cl. 365-203.000.

Dick, Melvin E.; and Peterson, Linn A., to General Motors Corporation. Isolated bumper for damping vibrations in vehicles. 4,509,781, Cl. 293-104.000.

Dickerson, Carroll D.: *See*—
Drotar, Frederick L.; Wotton, David R.; Dickerson, Carroll D.; and Makowski, Lawrence A., 4,509,772, Cl. 280-661.000.

Dickes, Eric J.; Hill, Thomas C., III; and Flegal, Robert T., to Tektronix, Inc. Phase lock loop having switchable filters and oscillators. 4,510,461, Cl. 331-1.00A.

Dickinson, Lawrence C. Skiving and roller burnishing tool. 4,509,885, Cl. 407-1.000.

Diehl GmbH & Co.: *See*—
Oellig, Oskar; Grimmer, Horst; and Lunz, Alfred-Gunther, 4,509,864, Cl. 368-108.000.

Diesel Kiki Company, Ltd.: *See*—
Ito, Satoru; and Endo, Masatoshi, 4,509,470, Cl. 123-179.00L.
Kawatei, Hisatsugu, 4,509,491, Cl. 123-502.000.
Ochiai, Kouji; and Tomita, Hitoshi, 4,509,492, Cl. 123-569.000.

Dijkshoorn, Willem: *See*—
Schmidt, Werner J.; Dijkshoorn, Willem; Stratmann, Wilhelm; and Vermaas, Leo F., 4,510,167, Cl. 426-607.000.

Dimick, David L.; Bly, Kenneth B.; and Ludecke, Otto A., to General Motors Corporation. Wall-flow monolith filter with porous plugs. 4,509,966, Cl. 55-502.000.

Diry, Andre. Filter designed for the simultaneous filtration and preheating of the fuel. 4,510,051, Cl. 210-94.000.

Discovision Associates: *See*—
Tabata, George K.; and Yardy, Raymond, 4,510,536, Cl. 360-65.000.

Dixie-Narco, Inc.: *See*—
Oden, Kenneth W., 4,509,658, Cl. 221-115.000.

DLP, Inc.: *See*—
DeVries, James H., 4,509,532, Cl. 128-736.000.

Doble Engineering Company: *See*—
Allfather, Lars P., 4,510,354, Cl. 200-11.00R.

Dr. Johannes Heidenhain GmbH: *See*—
Feichtinger, Kurt, 4,509,264, Cl. 33-169.00R.
Nelle, Guenther, 4,509,262, Cl. 33-125.00R.

Dodge, Frederick A.: *See*—
Curtis, Huntington W.; Dodge, Frederick A.; Francis, David B.; and Mizzi, John V., 4,509,530, Cl. 128-710.000.

Dohner, Jeffrey L.: *See*—
Erwin, Lewis; and Dohner, Jeffrey L., 4,509,360, Cl. 73-61.00R.

Doi, Hiyoshi: *See*—
Kawaguchi, Toshihiro; Ishizaka, Mineo; and Doi, Hiyoshi, 4,509,568, Cl. 141-129.000.

Doi, Yuji: *See*—
Matsushita, Shigetada; and Doi, Yuji, 4,509,366, Cl. 73-861.020.

Dolson, Richard G., to Veeder Industries Inc. Portable voting booth. 4,510,378, Cl. 235-50.00R.

Donahoe, Patricia K.; Budzik, Gerald P.; and Swann, David A., to General Hospital Corporation, The. Purified Mullerian Inhibiting Substance and method of use. 4,510,131, Cl. 424-105.000.

Donaldson, Charles W., to General Electric Company. Turbine blade measurement. 4,509,265, Cl. 33-174.0PA.

Donaldson Company, Inc.: *See*—
Engel, Mark R., 4,509,960, Cl. 55-287.000.

Donaldson, David L., to Chemfix Technologies, Inc. Method for treating liquid and semi-solid organic waste materials. 4,509,696, Cl. 241-15.000.

Donatelli, Eugene R. Building structure. 4,509,302, Cl. 52-82.000.

Doniwa, Tabito, to Daiichi Dentsu Kabushiki Kaisha. Nut runner control circuit. 4,510,424, Cl. 318-432.000.

Dougherty, John J., to General Electric Company. Transceiver circuit for interfacing between a power line communication system and a data processor. 4,510,611, Cl. 375-8.000.

Dow Chemical Company, The: *See*—
Cleereman, Kenneth J.; Raspor, O. Carl; and Burmester, Alan F., 4,510,108, Cl. 264-119.000.
Damrow, Paul A.; and Tsang, Floris Y., 4,509,254, Cl. 29-623.500.
Earl, Robert B.; Larson, David B.; and Nguyen, Huy X., 4,509,598, Cl. 166-308.000.
Kurfman, Virgil B., 4,510,208, Cl. 428-624.000.
Pawloski, Chester E.; and Ginter, Sally P., 4,510,101, Cl. 260-928.000.
Tonokawa, Hiroshi; and Nakamura, Masao, 4,510,268, Cl. 521-146.000.

Downar, Denise J.: *See*—
Culp, Charles H.; and Downar, Denise J., 4,510,398, Cl. 307-35.000.

Draft Systems, Inc.: *See*—
Fallon, Merton R., 4,509,663, Cl. 222-400.700.

Drahnak, Timothy J., to Minnesota Mining and Manufacturing Company. Platinum complex. 4,510,094, Cl. 260-429.0CY.

Draw-Tite, Inc.: *See*—
Young, David A.; and Hummel, William H., 4,509,770, Cl. 280-507.000.

Dreiling, Ronald; and Perrella, Blaine. Gun trigger lock. 4,509,281, Cl. 42-1.00Y.

Dresser Industries, Inc.: *See*—
Baron, George B., 4,509,895, Cl. 414-685.000.
Saxman, William C.; and Parker, Larry J., 4,509,607, Cl. 175-227.000.
Verbos, Stephen P., 4,509,620, Cl. 188-171.000.

Dril-Quip Inc.: *See*—
Walker, James M., 4,509,777, Cl. 285-286.000.

Drotar, Frederick L.; Wotton, David R.; Dickerson, Carroll D.; and Makowski, Lawrence A., to Ford Motor Company. One-piece adjusting sleeve. 4,509,772, Cl. 280-661.000.

Du Pont Canada Inc.: *See*—
Hajto, Ernest A., 4,509,998, Cl. 149-2.000.

Dubois, Jerry M.; and Spanjer, Keith G., to Motorola, Inc. Electrically isolated semiconductor power device. 4,510,519, Cl. 357-81.000.

Dubos, Jacques: *See*—
Arditty, Herve ; Bourbin, Yannic; Dubos, Jacques; Gautnier, Francis; and Graindorge, Philippe, 4,509,968, Cl. 65-10.100.

Ductmate Industries: *See*—
Arnoldt, Peter J., 4,509,778, Cl. 285-406.000.

Dudouyt, Jean-Paul. Post assembly for knock-down furniture. 4,509,806, Cl. 312-257.0SK.

Dugan, Michael T.: *See*—
Ippolito, Ronald A.; and Dugan, Michael T., 4,509,851, Cl. 355-14.00C.

Dugot, Richard S., to Biolectron, Inc. Electrical stimulating apparatus. 4,509,520, Cl. 128-419.00F.

Duke, June T.; Samuels, Kenneth E.; and Brown, Mary-Catherine, to Standard Oil Company, The. Film-forming compositions of nitrile polymer latex blends. 4,510,204, Cl. 428-463.000.

Dummermuth, Ernst, to Allen-Bradley Company. Programmable controller with intelligent positioning I/O modules. 4,510,565, Cl. 364-136.000.

Dunlop Limited: *See*—
Cheetham, Ivan C.; and Pope, George A., 4,509,559, Cl. 138-121.000.
Slater, Christopher J., 4,509,558, Cl. 138-104.000.

Dunne, Maurice J., to Unimation, Inc. Control system for manipulator apparatus with initializing stabilization and inertia scaling. 4,510,428, Cl. 318-632.000.

Duplessis, Philippe: *See—*
Delpit, Philippe; Duplessis, Philippe; and Renaudin, Yves, 4,510,601, Cl. 370-110.300.

Duplex Lighting, Inc.: *See—*
Welch, Thomas M., 4,509,881, Cl. 403-229.000.

Du Pont de Nemours, E. I., and Company: *See—*
Booker, Reginald A., 4,510,237, Cl. 430-621.000.
Covelenkie, Richard A.; and Lee, Shung-Yan L., 4,510,230, Cl. 430-273.000.
Hatchard, William R., 4,510,202, Cl. 428-295.000.
Levy, Stanley B., 4,510,300, Cl. 526-247.000.
Levy, Stanley B., 4,510,301, Cl. 526-254.000.
Lindsey, Roland G.; and Simms, John A., 4,510,298, Cl. 526-87.000.
Litt, Gerald J.; and Litt, Lloyd C., 4,510,392, Cl. 250-475.200.
Moberg, William K., 4,510,136, Cl. 514-63.000.
Peet, William G.; and Tebbe, Frederick N., 4,510,327, Cl. 568-1.000.
Pruckmayr, Gerfried, 4,510,333, Cl. 568-617.000.
Romanauskas, William A., 4,509,940, Cl. 494-16.000.
Smith, Malcolm S., 4,510,281, Cl. 524-229.000.

Duracell Inc.: *See—*
Gopikanth, Mysore L.; Kuo, Han C.; and Schlaikjer, Carl R., 4,510,220, Cl. 429-225.000.

Duranleau, Roger G.: *See—*
Lambert, Clifford L., Jr.; and Duranleau, Roger G., 4,510,326, Cl. 564-132.000.

Durbye, Hartmut, to Mars Inc. Animal litter and process for the production thereof. 4,509,457, Cl. 119-1.000.

Dybdal, Robert B.: *See—*
Mori, Tsutomu T.; Dybdal, Robert B.; and Etcheverry, Robert D., 4,510,622, Cl. 455-67.000.

Dynamit Nobel Aktiengesellschaft: *See—*
Glembin, Dirk; Huhn, Kurt; Meyer, Gunter; and Thallmeier, Manfred, 4,510,334, Cl. 568-643.000.
Hulsmann, Hans L., 4,510,093, Cl. 260-410.90N.

E.C.H. Will (GmbH & Co.): *See—*
Brandt, Eckhard; and Wolf, Wolfram, 4,509,417, Cl. 100-90.000.

Earl, Robert B.; Larson, David B.; and Nguyen, Huy X., to Dow Chemical Company, The. Fracturing fluids containing bouyant inorganic diverting agent and method of use in hydraulic fracturing of subterranean formations. 4,509,598, Cl. 166-308.000.

Earle, William H.: *See—*
Caslavsky, Jaroslav L.; Lavoie, Gerald H.; Earle, William H.; and Viechnicki, Dennis J., 4,510,609, Cl. 373-110.000.

Eastman Kodak Company: *See—*
Weemes, Doyle A.; and Seymour, Robert W., 4,510,205, Cl. 428-483.000.

Eastmond, Bruce C.: *See—*
Thompson, Sharon E.; and Eastmond, Bruce C., 4,510,624, Cl. 455-223.000.

Ebauches Electroniques S.A.: *See—*
Cleusix, Willy; and Nikles, Francois, 4,509,867, Cl. 368-321.000.

Eberle, Kelly L. Method for manufacture of a storage battery. 4,509,253, Cl. 29-623.100.

Eberline, William C.; Radtke, Norman H.; and Van Camp, Robert L., to Walbro Corporation. Start system for internal combustion engines. 4,509,471, Cl. 123-179.00G.

Ebi, Yutaka: *See—*
Horike, Masanori; Furukawa, Tatsuya; Sekiya, Takuro; Ebi, Yutaka; Isayama, Takuro; and Tachiki, Masaaki, 4,510,509, Cl. 346-140.00R.

Ebihara, Tadashi, to Nippon Piston Ring Co., Ltd. Composite valve seat. 4,509,722, Cl. 251-359.000.

Ebisawa, Mikio: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,510,328, Cl. 568-32.000.

Eby, Jeffrey; and Spector, George. Elastic top bag. 4,509,570, Cl. 141-390.000.

Eckstein, Udo, to Bayer Aktiengesellschaft. Water-insoluble azolystyryl optical brighteners. 4,510,311, Cl. 548-132.000.

Econolite Control Products, Inc.: *See—*
Tedesco, Jack, 4,510,549, Cl. 361-86.000.

Economics Laboratory, Inc.: *See—*
Salmonson, Duane L., 4,509,402, Cl. 91-275.000.

Edelmann, Karl R. Thermostat housing assembly. 4,509,465, Cl. 123-41.020.

Eden, J. Gary: *See—*
Manuccia, Thomas J.; and Eden, J. Gary, 4,509,522, Cl. 128-634.000.

Edwards, Ivan L.; McLaughlin, Robert C.; and Macrander, Max S., to GTE Automatic Electric Inc. Circuit to minimize local clock frequency disturbances when phase locking to a reference clock circuit. 4,510,462, Cl. 331-1.00A.

Edwards, Jack F. Lawn mower sharpener. 4,509,316, Cl. 56-250.000.

Edwards, Robert C.: *See—*
Udovich, Carl A.; and Edwards, Robert C., 4,510,259, Cl. 502-209.000.

Edwards, Thomas J.: *See—*
Bennett, Douglas L.; Edwards, Thomas J.; and Rowles, Howard C., 4,510,023, Cl. 203-99.000.

Eertink, Bastiaan B. B., to Oce-Nederland B.V. Stepping motor controller. 4,510,266, Cl. 318-696.000.

Egawa, Takeshi: *See—*
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,509,842, Cl. 354-402.000.

Eggert, Holger: *See—*
Markart, Ernst; Blumel, Reinhard; and Eggert, Holger, 4,509,859, Cl. 356-446.000.

Eguchi, Yasukata: *See—*
Tamiya, Yoshimichi; and Eguchi, Yasukata, 4,509,441, Cl. 112-158.00B.

Eibl, Johann; Hetzl, Ernst; and Linnau, Yendra, to Immuno Aktiengesellschaft fur chemisch-medizinische Produkte. Method of producing an antithrombin III-heparin concentrate or antithrombin III-heparinoid concentrate. 4,510,084, Cl. 260-112.00B.

Eicher, Dean A.; and McKee, Fount E., to Delta-X Corporation. Gas gun for determining the liquid level of a well. 4,509,552, Cl. 137-557.000.

Eidenschink, Rudolf; Haas, Gunther; Pohl, Ludwig; Romer, Michael; Scheuble, Bernhard; and Weber, Georg, to Merck Patent Gesellschaft mit beschrankter Haftung. Cyclohexane derivatives. 4,510,069, Cl. 252-299.610.

Eilerman, Robert G.: *See—*
Willis, Brian J.; Eilerman, Robert G.; Christenson, Philip A.; and Yurecko, John M., Jr., 4,510,319, Cl. 560-231.000.

Eimerl, David: *See—*
Summers, Mark A.; Eimerl, David; and Boyd, Robert D., 4,510,402, Cl. 307-427.000.

Eineichner, Donald E.; Chandra, Rangasami S.; and Tucci, James M., to FMC Corporation. Method and apparatus for weighing a sucker-rod pumped well. 4,509,365, Cl. 73-151.000.

Eisai Co., Ltd.: *See—*
Sakashita, Shigeru; Nakagawa, Takeshi; Ohwaki, Takayuki; and Miyake, Yasuo, 4,510,168, Cl. 427-3.000.

Eissenberg, David M.: *See—*
Horton, Joel R.; and Eissenberg, David M., 4,510,121, Cl. 422-232.000.

Eitzinger, Robert, to Mid-West Automation Inc. Inspection, rejection and sorting machine. 4,509,646, Cl. 209-573.000.

Eklof, Ulf, to Alfa-Laval Separation AB. Operating system for centrifugal separators. 4,510,052, Cl. 210-139.000.

Electricite de France Service National: *See—*
Bensadoun, Michel, 4,510,483, Cl. 338-80.000.

Electrohome Limited: *See—*
Desjardins, Francois G., 4,510,432, Cl. 320-1.000.

Eli Lilly and Company: *See—*
Geselchen, Paul D.; and Shuman, Robert T., 4,510,082, Cl. 260-112.50R.

Elkem Metals Company: *See—*
Wright, Dennis C.; and Camodeca, Ernest J., 4,509,717, Cl. 251-144.000.

Elliesen, Wolfgang, to Joh. Friedrich Behrens AG. Sound-dampened driving apparatus for fasteners. 4,509,669, Cl. 227-130.000.

Ellis, Ralph J.; Gurtler, Richard W.; and Sarma, Kalluri R., to Motorola, Inc. Method for semiconductor ribbon-to-ribbon conversion. 4,510,015, Cl. 156-617.00R.

Elton, Richard K., to General Electric Company. Semiconductive glass fibers and method. 4,510,077, Cl. 252-502.000.

Elwood Manufacturing Company: *See—*
Jones, Donald D., 4,509,626, Cl. 192-85.0AA.

Emery, Leonard W., to Atlantic Richfield Company. Enhanced oil recovery. 4,509,596, Cl. 166-263.000.

Emhart Industries, Inc.: *See—*
Abbott, Vaughan, 4,509,969, Cl. 65-300.000.

Emori, Hiroshi: *See—*
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.

Emsley, Robert M.; and Pitt, Derek C., to Post Office, The. Sorting system. 4,509,635, Cl. 198-365.000.

ENDECO Canada Limited: *See—*
Brainard, Edward C., II, 4,510,551, Cl. 361-398.000.

Endo, Masatoshi: *See—*
Ito, Satoru; and Endo, Masatoshi, 4,509,470, Cl. 123-179.00L.

Endo, Satoru: *See—*
Yabe, Misoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, 4,510,413, Cl. 313-460.000.

Energy Control Products, Inc.: *See—*
Carney, George T.; and Heath, Gary C., 4,509,585, Cl. 165-12.000.

Energy Products of Idaho: *See—*
Sowards, Norman K., 4,510,021, Cl. 201-4.000.

Energy Recovery Group, Inc.: *See—*
Adams, Jack C., 4,509,435, Cl. 110-344.000.

Enga, Bernard E., to Johnson Matthey, Inc. Regenerating catalytic particulate filters and apparatus therefor. 4,509,327, Cl. 60-274.000.

Engdahl, Jean; and Formaz, Jerome, to Fordahl S.A.R.L. Programmable logic apparatus for entering, processing and transmitting data. 4,510,602, Cl. 371-21.000.

Engel, Mark R., to Donaldson Company, Inc. Dust collector. 4,509,960, Cl. 55-287.000.

Engelhard Corporation: *See—*
Harrison, William S., 4,510,369, Cl. 219-389.000.
Hartwig, Michael M., 4,510,265, Cl. 502-330.000.

England, W. Dean; and Enneking, Gerald J. Damper control. 4,509,498, Cl. 126-288.000.

Enneking, Gerald J.: *See—*
England, W. Dean; and Enneking, Gerald J., 4,509,498, Cl. 126-288.000.
Environmental Research Institute of Michigan, The: *See—*
Lougheed, Robert M.; and Mudge, Trevor N., 4,510,616, Cl. 382-8.000.
Peterson, Lauren M., 4,509,829, Cl. 350-358.000.
Epes, Jack R. Method and apparatus for inserting insulation in preexisting building structures. 4,509,304, Cl. 52-127.300.
Erben, Edwin: *See—*
Cornils, Boy; Tihanyi, Bela; Weber, Jurgen; DeWin, Werner; Erben, Edwin; and Muhlratzer, August, 4,510,182, Cl. 427-162.000.
Erickson, Jack A.: *See—*
Davich, Luke J.; Erickson, Jack A.; and Proulx, Richard W., 4,509,428, Cl. 102-466.000.
Erlam, David P.; and Carr, Arthur E., to Rittal-Werk Rudolf Loh GmbH & Co. KG. Rack with card frames adjustable on lateral slide guides. 4,509,810, Cl. 339-17.00M.
Ermak, Boris, to Stevens, Robert D. Mixture of three refrigerants. 4,510,064, Cl. 252-67.000.
Ernst, Hans-Hellmut; and Seel, Holger, to AUTOFLUG GmbH. Self-locking belt reeling device for motor vehicle safety belts. 4,509,707, Cl. 242-107.40A.
Ernst, Richard R.; Wuthrich, Kurt; and Macura, Slobodan, to Spectrospin AG. Method for recording two-dimensional nuclear magnetic resonance spectra and a device for carrying out the same. 4,510,449, Cl. 324-309.000.
Erwin, Lewis; and Dohner, Jeffrey L., to Massachusetts Institute of Technology. On-line measurement of fluid mixtures. 4,509,360, Cl. 73-61.00R.
Erwin, Timothy R., to Pitney Bowes Inc. Postage access door for postage meters. 4,509,780, Cl. 292-307.00R.
Esayan, Mariana; and Vilain, Michel, to Framatome & Cie. Device for safety injection on a pressurized-water nuclear reactor. 4,510,118, Cl. 376-282.000.
Escher Wyss Aktiengesellschaft: *See—*
Volz, Karl; Link, Christoph; Stotz, Wolf-Gunter; and Heitmann, Peter, 4,509,237, Cl. 29-116.0AD.
Esmet, Inc.: *See—*
Shaw, Charles R., 4,509,233, Cl. 24-136.00R.
Esser, Heinz: *See—*
Cornely, Wolfgang; Esser, Heinz; and Schmidt, Rudolf, 4,510,180, Cl. 427-136.000.
Estel Hoesch Werke Aktiengesellschaft: *See—*
Bottcher, Wolfgang; Juttner, Heinz; Maurer, Albrecht; and Stutzinger, Ferdinand, 4,509,295, Cl. 51-49.000.
Etablissements-Pierre Fontaine: *See—*
Legoult, Michel, 4,510,401, Cl. 307-66.000.
Etablissements Rondolotti: *See—*
Rolin, Guy; and Rabizzoni, Jacques, 4,509,351, Cl. 72-19.000.
Etcheverry, Robert D.: *See—*
Mori, Tsutomu T.; Dybdal, Robert B.; and Etcheverry, Robert D., 4,510,622, Cl. 455-67.000.
Ethicon, Inc.: *See—*
Bezwada, Rao S.; Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,510,295, Cl. 525-437.000.
Ethyl Corporation: *See—*
Braxton, Henry G., Jr., 4,509,952, Cl. 44-57.000.
Jones, Jesse D.; and Hornbaker, Edwin D., 4,510,280, Cl. 524-178.000.
Knapp, Gordon G., 4,509,951, Cl. 44-53.000.
Eue, Ludwig: *See—*
Forster, Heinz; Hofer, Wolfgang; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,509,971, Cl. 71-90.000.
Evans, David D., to Imperial Chemical Industries PLC. Method for combating pests. 4,510,133, Cl. 514-30.000.
Evans, Graham: *See—*
Kingston, Samuel B.; and Evans, Graham, 4,510,238, Cl. 430-627.000.
Evans, Robert J., to Aurora Equipment Company. Cart with plastic toolholder. 4,509,649, Cl. 211-70.600.
Evans, Thomas E.: *See—*
Jovick, Raymond J.; Malott, Roger J.; and Evans, Thomas E., 4,510,408, Cl. 310-168.000.
Everitt, Delmar K.: *See—*
Goldfarb, Adolph E.; and Everitt, Delmar K., 4,509,760, Cl. 273-380.000.
Everlite A/S: *See—*
Sokoler, Henryk; and Pedersen, Eigil, 4,509,306, Cl. 52-302.000.
Exxon Production Research Co.: *See—*
Moyer, Mark C., 4,510,447, Cl. 324-225.000.
Exxon Research and Engineering Co.: *See—*
Beaudet, Emilien, 4,509,307, Cl. 52-309.400.
McVicker, Gary B., 4,510,096, Cl. 260-439.00R.
Muhle, Mike E.; Stolz, Richard J.; and Wright, Cecil W., 4,510,271, Cl. 523-346.000.
Stiefel, Edward I.; Pan, Wie-Hin; and Chianelli, Russell R., 4,510,260, Cl. 502-219.000.
Thompson, John A., 4,510,047, Cl. 208-321.000.
Ezis, Andre; and Blair, Howard D., to Ford Motor Company. Method of making densified Si_3N_4/oxynitride composite with premixed silicon and oxygen carrying agents. 4,510,107, Cl. 264-65.000.
Fabrications Automatiques Gerbelot: *See—*
Gerbellot-Barrillon, Pierre, 4,509,919, Cl. 433-57.000.
Failla, William G. High and low pressure, quick-disconnect coupling. 4,509,554, Cl. 137-614.050.
Fairchild Industries, Inc.: *See—*
Sheek, Roy S., 4,509,888, Cl. 410-105.000.
Fallon, Merton R., to Draft Systems, Inc. Locking mechanism and valve assembly. 4,509,663, Cl. 222-400.700.
Fanuc Ltd.: *See—*
Kishi, Hajimu; and Seki, Masaki, 4,510,568, Cl. 364-300.000.
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Murakami, Kunihiko, 4,510,427, Cl. 318-590.000.
Obara, Haruki, 4,510,367, Cl. 219-69.00W.
Farmitalia Carlo Erba S.p.A.: *See—*
Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, 4,510,149, Cl. 514-341.000.
Farr, Kenneth. Collapsible expansible handling facility for unitized and unit loads. 4,509,433, Cl. 108-52.100.
Farrar, David; and Hawe, Malcolm, to Allied Colloids Limited. Calcium carbonate dispersions. 4,509,987, Cl. 106-308.00Q.
Faruk, Erol A., to Beecham Group p.l.c. Antihypertensive chromenes and chromans. 4,510,152, Cl. 514-321.000.
Faultersack, David D., to Burroughs Corporation. Electromechanical assembly for aligning, discharging, and sequentially engaging conductors of a P.C. board with a backplane. 4,510,553, Cl. 361-413.000.
Federal Cartridge Corporation: *See—*
Davich, Luke J.; Erickson, Jack A.; and Proulx, Richard W., 4,509,428, Cl. 102-466.000.
Feedmobile, Inc.: *See—*
High, Sam; and Mast, Aquila D., 4,509,862, Cl. 366-158.000.
Feichtinger, Kurt, to Dr. Johannes Heidenhain GmbH. Sensing head with overload protection. 4,509,264, Cl. 33-169.00R.
Feintool AG Lyss: *See—*
Haack, Johannes, 4,509,395, Cl. 83-55.000.
Fekete, Gyorgy: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.
Felice, Frank T.; and Yonushonis, Celeste B., to Combustion Engineering, Inc. Aluminum resistant ceramic fiber composition. 4,510,253, Cl. 501-95.000.
Fernand Flamand Ltee: *See—*
Boilard, Raynald, 4,509,294, Cl. 49-504.000.
Filipot, Hermann: *See—*
Schrofelbauer, Herbert; Kakl, Josef; Staudinger, Gernot; and Filipot, Hermann, 4,509,436, Cl. 110-345.000.
Filley, Daniel E.: *See—*
Cooper, Merton G.; Kerns, William R.; Filley, Daniel E.; and Koschnick, Gary A., 4,509,549, Cl. 137-327.000.
Fine Particles Technology Corporation: *See—*
Wiech, Raymond E., Jr., 4,510,347, Cl. 174-68.500.
Finkbeiner, Ernest, to Mid-West Transformer Company. Coil body. 4,510,478, Cl. 336-198.000.
Firey, Joseph C. Cyclic char gasifier. 4,509,957, Cl. 48-61.000.
Fischer, Artur; and Walther, Horst, to Fischer, Artur. Method and a device for securing double-wall panels to substructures. 4,509,246, Cl. 29-526.00R.
Fischer, Gert; and Lather, Dieter, to Mannesmann Aktiengesellschaft. Test head mounting for single or multiple test heads. 4,509,815, Cl. 339-147.00P.
Fischer, Richard J., to Gates Rubber Company, The. Radially extensible joint packing with helical spring support means. 4,509,763, Cl. 277-163.000.
Fisher, Charles B.; and Fisher, Sidney T. Predistorted AM stereo transmission. 4,510,614, Cl. 381-16.000.
Fisher Controls International, Inc.: *See—*
Gassman, George W.; and Varnum, Gerald F., 4,509,403, Cl. 91-365.000.
Fisher, Sidney T.: *See—*
Fisher, Charles B.; and Fisher, Sidney T., 4,510,614, Cl. 381-16.000.
Fisons plc: *See—*
Altounyan, Roger E. C.; and Auty, Richard M., 4,509,515, Cl. 128-200.230.
Flannery, Stephen W.: *See—*
Bendall, Brian; and Flannery, Stephen W., 4,509,677, Cl. 236-122.000.
Flaten, James F., to Tobin-Arp Manufacturing Company. Preset indicator assembly. 4,509,267, Cl. 33-185.00R.
Fleck, Frank: *See—*
Heiman, Gerald R.; and Fleck, Frank, 4,509,682, Cl. 239-60.000.
Fleckenstein, Volker: *See—*
Assbeck, Franz; and Fleckenstein, Volker, 4,510,434, Cl. 323-237.000.
Flegal, Robert T.: *See—*
Dickes, Eric J.; Hill, Thomas C., III; and Flegal, Robert T., 4,510,461, Cl. 331-1.00A.
Flinn, Heather Anne, executrix: *See—*
Flinn, Ian, deceased; and Murray, Robert, 4,510,471, Cl. 333-195.000.
Flinn, Ian, deceased (by Flinn, Heather Anne, executrix); and Murray, Robert, to U.S. Philips Corporation. Acoustic surface wave device including a reflective multistrip coupler. 4,510,471, Cl. 333-195.000.
Floreancig, Antoine, to Uranium Pechiney Ugine Kuhlmann. Process for extracting uranium from phosphoric acids by means of alkylpyrophosphoric acids. 4,510,122, Cl. 423-10.000.
FMC Corporation: *See—*
Eineichner, Donald E.; Chandra, Rangasami S.; and Tucci, James M., 4,509,365, Cl. 73-151.000.

McTamaney, Louis S.; Delfino, Allan B.; and Bisbee, Gary W., 4,509,901, Cl. 417-18.000.
Focke & Co.: *See*—
Focke, Heinz; and Mutschall, Hugo W., 4,509,310, Cl. 53-170.000.
Focke, Heinz; and Mutschall, Hugo W., to Focke & Co. Apparatus for the production of packs, especially cigarette cartons. 4,509,310, Cl. 53-170.000.
Fogelson, Seymour, to Fogelson, Seymour. Apparatus for stabilizing plant support stakes in pots. 4,509,289, Cl. 47-70.000.
Fohl, Artur, to REPA Feinstanzwerk GmbH. Mechanism in roll-up device for safety belts in motor vehicles. 4,509,708, Cl. 242-107.700.
Forbus, Ellen: *See*—
Morris, Horton H.; Whyte, John R., Jr.; Forbus, Ellen; Dentan, Catherine M.; and Collins, David R., 4,510,254, Cl. 501-146.000.
Ford Motor Company: *See*—
Drotar, Frederick L.; Wotton, David R.; Dickerson, Carroll D.; and Makowski, Lawrence A., 4,509,772, Cl. 280-661.000.
Ezis, Andre; and Blair, Howard D., 4,510,107, Cl. 264-65.000.
Hunt, Thomas K., 4,510,210, Cl. 429-11.000.
Schowiak, Duane C., 4,509,684, Cl. 239-112.000.
Ufrecht, Martin; and Rest, Heinz, 4,509,293, Cl. 49-502.000.
Vahratian, Adam; Maynard, Roosevelt, Jr.; Croswhite, Howard L.; and Liang, Po-Lung, 4,509,389, Cl. 74-695.000.
Fordahl S.A.R.L.: *See*—
Engdahl, Jean; and Formaz, Jerome, 4,510,602, Cl. 371-21.000.
Foresi, Anthony; and Naysmith, Peter, to Anthony Foresi & Associates, Inc. Sheet stacking system. 4,509,740, Cl. 271-224.000.
Formaz, Jerome: *See*—
Engdahl, Jean; and Formaz, Jerome, 4,510,602, Cl. 371-21.000.
Forster, Hans-Joachim; Lubbing, Bernd-Eric; and Letsche, Ulrich, to Daimler-Benz Aktiengesellschaft. Process and apparatus for intermittent control of a cyclically operating internal combustion engine. 4,509,488, Cl. 123-481.000.
Forster, Heinz; Hofer, Wolfgang; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., to Bayer Aktiengesellschaft. Benzothiazole substituted carboxylic acid amide compounds and herbicidal methods compositions thereof. 4,509,971, Cl. 71-90.000.
Fossett, Lawrence D.: *See*—
Costello, Peter E.; Fossett, Lawrence D.; Lane, Michael S.; Quin, Terrence T.; and Smith, Nicholas K., 4,510,351, Cl. 179-27.00D.
Foster, Randy C.; Hackard, Roger G.; and Wilson, Leslie B., to Dayco Corporation. Belt tensioner and method of making the same. 4,509,935, Cl. 474-138.000.
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., to General Electric Company. Polycarbonate/condensation polymer blends. 4,510,289, Cl. 525-148.000.
Fox, Thomas J.: *See*—
Green, Harold V.; Fox, Thomas J.; and Scallan, Anthony M., 4,510,020, Cl. 162-169.000.
Foxboro Company, The: *See*—
Hubball, John A.; and Barry, Eugene F., 4,509,964, Cl. 55-386.000.
Fraden, Jacob, to Timex Medical Products Corporation. Cardio-respiration transducer. 4,509,527, Cl. 128-671.000.
Fraioli, Anthony V., to United States of America, Energy. Solid oxide fuel cell having compound cross flow gas patterns. 4,510,212, Cl. 429-30.000.
Fram, Jerry R. Catalyst slave pump. 4,509,903, Cl. 417-464.000.
Framatome & Cie.: *See*—
Esayan, Mariana; and Vilain, Michel, 4,510,118, Cl. 376-282.000.
Francis, David B.: *See*—
Curtis, Huntington W.; Dodge, Frederick A.; Francis, David B.; and Mizzi, John V., 4,509,530, Cl. 128-710.000.
Franks, Joseph, to Ion Tech Limited. Thinning of specimens for examination under the electron microscope. 4,510,386, Cl. 250-251.000.
Franzel, John R.: *See*—
Reece, John M.; Martin, Robert G.; and Franzel, John R., 4,510,572, Cl. 364-489.000.
Frederick, Larry J. Traversing blade-rotary propeller. 4,509,899, Cl. 416-99.000.
Fredericks, Ronald D., Jr.: *See*—
Young, Randall S.; and Fredericks, Ronald D., Jr., 4,510,072, Cl. 252-380.000.
Freeland, John A.; and Freeland, Robert D. Combination bearing removal and installation tool. 4,509,241, Cl. 29-263.000.
Freeland, Robert D.: *See*—
Freeland, John A.; and Freeland, Robert D., 4,509,241, Cl. 29-263.000.
Freeport Minerals Company: *See*—
Wiewiorowski, Tadeusz; and Mollere, Phillip D., 4,510,027, Cl. 204-110.000.
Freermann, Johannes, to Carl Schmale KG. Stitching assembly for selvedging machine. 4,509,440, Cl. 112-153.000.
Frei, Max, to Schenker Maschinen AG. Spring coiling machine. 4,509,352, Cl. 72-138.000.
Freitag, Hans-Albrecht: *See*—
Kopp, Richard; and Freitag, Hans-Albrecht, 4,510,269, Cl. 521-166.000.
Freitag, Wolfgang. Plug connector for co-axial electrical cables. 4,509,816, Cl. 339-177.00R.
Freysinet International (STUP): *See*—
Guinard, Pierre, 4,509,305, Cl. 52-223.00R.
Frick, Adolf, to Stoechio-Matic AG. Apparatus for the combustion of liquid fuels in the gaseous state. 4,509,914, Cl. 431-121.000.
Fritzsche Dodge & Olcott Inc.: *See*—
Willis, Brian J.; Eilerman, Robert G.; Christenson, Philip A.; and Yurecko, John M., Jr., 4,510,319, Cl. 560-231.000.
Frost, John G.: *See*—
Money, David K.; Swift, Stephen; MacLaurin, Andrew; and Frost, John G., 4,509,529, Cl. 128-708.000.
Frykhult, Rune H.; and Rundquist, Lars-Goran, to AB Celleco. Hydrocyclone separator. 4,510,056, Cl. 210-512.100.
Fuhge, Peter; Braun, Konrad; and Becker, Udo, to Hoechst Aktiengesellschaft. Reagent for the determination of ristocetin cofactor (v.Willebrand factor). 4,510,126, Cl. 424-3.000.
Fuji Electric Company, Ltd.: *See*—
Fumoto, Takabumi, 4,510,389, Cl. 250-339.000.
Matsushita, Shigetada; and Doi, Yuji, 4,509,366, Cl. 73-861.020.
Fuji Electric Corporate Research and Development, Ltd.: *See*—
Fumoto, Takabumi, 4,510,389, Cl. 250-339.000.
Fuji Jukogyo Kabushiki Kaisha: *See*—
Takahashi, Toshio, 4,509,363, Cl. 73-118.000.
Fuji Koeki Kabushiki Kaisha: *See*—
Takematsu, Yoshiyuki, 4,509,844, Cl. 354-416.000.
Takematsu, Yoshiyuki, 4,510,419, Cl. 315-241.00P.
Fuji Photo Film Co., Ltd.: *See*—
Fujino, Sigeo; Hase, Takashi; and Toshinai, Akio, 4,510,414, Cl. 313-468.000.
Ogawa, Hiroshi; Mizuno, Chiaki; and Tamai, Yasuo, 4,510,203, Cl. 428-425.900.
Oka, Yutaka; Saeki, Naomi; and Fuseya, Yoshiharu, 4,510,229, Cl. 430-265.000.
Seshimoto, Osamu, 4,510,035, Cl. 204-411.000.
Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; Toya, Ichizo; and Syuto, Sadanobu, 4,510,235, Cl. 430-574.000.
Yamazaki, Hisashi; and Ochiai, Takeji, 4,510,388, Cl. 250-327.200.
Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,510,233, Cl. 430-527.000.
Fuji Xerox Co., Ltd.: *See*—
Kurata, Masami; Inui, Toshiharu; and Ohmori, Takashi, 4,510,523, Cl. 358-75.000.
Kurata, Masami, 4,510,524, Cl. 358-80.000.
Moriguchi, Haruhiko; Moriguchi, Fujio; and Ohmori, Takashi, 4,510,506, Cl. 346-76.0PH.
Tamai, Masayoshi; Iyoda, Tetsuo; and Koizumi, Yukihisa, 4,510,504, Cl. 346-75.000.
Tan, Yoichi, 4,510,600, Cl. 370-94.000.
Fujie, Hirokazu: *See*—
Matsuoka, Hiroo; Matsuoka, Seiichi; Yamabe, Tsunekichi; Fujie, Hirokazu; Mori, Kenji; Tamura, Kouji; Yamada, Masatoshi; and Furuta, Akio, 4,510,264, Cl. 502-328.000.
Fujii, Chigusa, heiress: *See*—
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.
Fujii, Kanichi; and Otaka, Masahiro, to Mita Industrial Co., Ltd. Laser tube utilizing negative glow. 4,510,608, Cl. 372-87.000.
Fujikawa, Katsuhiro; and Gohda, Osamu, to Mitsubishi Denki K.K. Sewing machine control device. 4,509,445, Cl. 112-317.000.
Fujima, Yasuo: *See*—
Bando, Niro; Kurohara, Kazuaki; Fujima, Yasuo; Ikeda, Fumihiro; Usiro, Kenzo; and Ogasawara, Hiroyuki, 4,509,614, Cl. 180-273.000.
Fujimaki, Akira, to Zaidan Hojin Minsei Kagaku Kyokai. Antihypertensive agents and process for producing the same. 4,510,161, Cl. 514-54.000.
Fujimaki, Yukiko: *See*—
Iida, Hideyo; Kato, Koumei; Mishuku, Toshio; and Fujimaki, Yukiko, 4,510,195, Cl. 428-215.000.
Fujino, Sigeo; Hase, Takashi; and Toshinai, Akio, to Fuji Photo Film Co., Ltd. Electron excited fluorescent display device including screen with rare earth phosphor exhibiting sublinear current density-emission luminance characteristics. 4,510,414, Cl. 313-468.000.
Fujioka, Atsushi: *See*—
Hoshi, Ikuo; Arai, Masami; Yokochi, Kiyoshi; Miyadera, Yasuo; Fujioka, Atsushi; and Nakagawa, Takehisa, 4,510,008, Cl. 156-245.000.
Fujioka, Futoshi: *See*—
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,510,080, Cl. 252-522.00R.
Fujita, Hisanori: *See*—
Kajita, Masaki; Nakaya, Tomio; Hasegawa, Shinichi; and Fujita, Hisanori, 4,510,515, Cl. 357-17.000.
Fujitsu Limited: *See*—
Furumura, Yuji; and Nishizawa, Takeshi, 4,510,177, Cl. 427-85.000.
Goto, Hiroshi; and Tabata, Akira, 4,509,249, Cl. 29-576.00W.
Kanno, Takashi; Oka, Akira; Okamoto, Ituo; Mizushima, Kouji; and Oguro, Shinji, 4,510,552, Cl. 361-413.000.
Miwa, Hirohide, 4,509,524, Cl. 128-660.000.
Takeda, Shiro; and Nakajima, Minoru, 4,510,283, Cl. 524-356.000.
Fukatsu, Kunio, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic transaction machine. 4,510,381, Cl. 235-379.000.
Fukatsu, Shunzo: *See*—
Minowa, Nobuto; Fukatsu, Shunzo; Niida, Taro; and Mase, Sadaaki, 4,510,102, Cl. 260-941.000.
Fukaya, Hirokazu: *See*—
Nishitoba, Shigeo; and Fukaya, Hirokazu, 4,509,494, Cl. 123-609.000.
Fukuda, Kikuo: *See*—
Yoshida, Tatsuo; Fukuda, Kikuo; and Tomiguchi, Akihiko, 4,509,319, Cl. 57-218.000.

Fukudome, Shinichi: *See*—
Hara, Noboru; Fukudome, Shinichi; Johna, Nobuo; and Nakamura, Masayoshi, 4,510,073, Cl. 252-383.000.

Fukui, Hiroshi, to Canon Kabushiki Kaisha. Thermal printer. 4,510,505, Cl. 346-76.0PH.

Fumagalli, Carlo: *See*—
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,510,258, Cl. 502-209.000.

Fumoto, Takabumi, to Fuji Electric Company, Ltd.; and Fuji Electric Corporate Research and Development, Ltd. Infrared film thickness gage. 4,510,389, Cl. 250-339.000.

Funk, Heinrich; Pakur, Henryk; and Seitz, Hans, to Continental Gummi-Werke Aktiengesellschaft. Pneumatic vehicle tire. 4,509,575, Cl. 152-356.00R.

Furrer, Andreas; and Milavec, Johann, to BBC Brown, Boveri & Company, Limited. Switching amplifier. 4,510,457, Cl. 330-10.000.

Furukawa, Tatsuya: *See*—
Horike, Masanori; Furukawa, Tatsuya; Sekiya, Takuro; Ebi, Yutaka; Isayama, Takuro; and Tachiki, Masaaki, 4,510,509, Cl. 346-140.00R.

Furumura, Yuji; and Nishizawa, Takeshi, to Fujitsu Limited. Method and apparatus for vapor phase deposition. 4,510,177, Cl. 427-85.000.

Furuta, Akio: *See*—
Matsuoka, Hiroo; Matsuoka, Seiichi; Yamabe, Tsunekichi; Fujie, Hirokazu; Mori, Kenji; Tamura, Kouji; Yamada, Masatoshi; and Furuta, Akio, 4,510,264, Cl. 502-328.000.

Furuya, Katusuke: *See*—
Watanabe, Kenkichi; and Furuya, Katusuke, 4,509,542, Cl. 133-8.00A.

Fury, Werner: *See*—
Meyer, Willy; and Fury, Werner, 4,510,325, Cl. 564-89.000.

Fuseya, Yoshiharu: *See*—
Oka, Yutaka; Saeki, Naomi; and Fuseya, Yoshiharu, 4,510,229, Cl. 430-265.000.

Fushimi, Hitoshi: *See*—
Mizokawa, Sadao; Hamada, Takuji; Tomizawa, Hiroshi; and Fushimi, Hitoshi, 4,510,494, Cl. 340-825.050.

G.D. Searle & Co.: *See*—
Hansen, Donald W., Jr.; and Papaioannou, Stamatios, 4,510,085, Cl. 260-112.50E.

Gagne, Roger A.; and Orchard, Rolf O., to Puritan-Bennett Corporation. One-piece nebulizer jet. 4,509,688, Cl. 239-338.000.

Gaitten, Dorothy A., executrix: *See*—
Gaitten, Walden M., deceased, 4,509,574, Cl. 144-208.00E.

Gaitten, Walden M., deceased (by Gaitten, Dorothy A., executrix), to Kockums Cancar, Corp. Feed roll spikes with plus-shaped cutting edges. 4,509,574, Cl. 144-208.00E.

Galani, Zvi; and Waterman, Raymond C., Jr., to Raytheon Company. Automatic gain controlled frequency discriminator for use in a phase locked loop. 4,510,463, Cl. 331-15.000.

Gallagher, Terry A.: *See*—
Ludwigsen, John S.; Ludwigsen, Jill L.; and Gallagher, Terry A., 4,509,344, Cl. 62-76.000.

Gambro Engstrom AB: *See*—
Gedeon, Andras; and Mathiasson, Lennart, 4,509,359, Cl. 73-23.000.

Gamze, Maurice G.; and Sprung, Louis H. Variable-speed constant-frequency alternator. 4,510,433, Cl. 322-32.000.

Ganoe, Oscar L.: *See*—
Mentzell, Walter J.; and Ganoe, Oscar L., 4,509,377, Cl. 73-862.560.

Garcia, Graham A.; and Cowen, Steven J., to United States of America, Navy. Semiconductor laser end-facet coatings for use in solid or liquid environments. 4,510,607, Cl. 372-49.000.

Garrett, Keith C., to AES Engineering Limited. Stationary assembly for mechanical shaft seal. 4,509,762, Cl. 277-81.00R.

Gartner, Klaus W. Protective lock mounting plate for safe door locks. 4,509,350, Cl. 70-333.00R.

Garvison, Geary L. Bowstring release mechanism. 4,509,497, Cl. 124-35.00A.

Gas Research Institute: *See*—
Schneider, William R.; and Smith, Robert B., 4,509,243, Cl. 29-402.020.

Gassman, George W.; and Varnum, Gerald F., to Fisher Controls International, Inc. Positioner having user-adjustable dynamic response. 4,509,403, Cl. 91-365.000.

Gaswarme-Institut e.V.: *See*—
Lorenz, Werner; Bathke, Heinz; and Sommers, Hans, 4,509,913, Cl. 431-90.000.

Gates Rubber Company, The: *See*—
Fischer, Richard J., 4,509,763, Cl. 277-163.000.

Gautnier, Francis: *See*—
Arditty, Herve ; Bourbin, Yannic; Dubos, Jacques; Gautnier, Francis; and Graindorge, Philippe, 4,509,968, Cl. 65-10.100.

Gay, Don D., to United States of America, Energy. Dual liquid and gas chromatograph system. 4,509,855, Cl. 356-72.000.

Gaz de France: *See*—
Simone, Pregermain; Henri, Charcosset; and Michele, Andres, 4,510,039, Cl. 208-10.000.

GCA Corporation/Tropel Division: *See*—
Smythe, Robert A.; Bunkenburg, Joachim; and Richardson, Gunnar D., 4,509,858, Cl. 356-358.000.

Geber, Hans, to Messer Griesheim GmbH. Process and device for scavenging a metal melt, in particular steel, in a casting ladle or the like provided with a plug closure. 4,509,977, Cl. 75-59.000.

Gedeon, Andras; and Mathiasson, Lennart, to Gambro Engstrom AB. Method and apparatus for measuring the concentration of a given component in a gas inhaled and/or exhaled by a patient. 4,509,359, Cl. 73-23.000.

Gehmaier, Johann: *See*—
Schonberger, Johann; Bloo, Johann; Mistlberger, Bruno; and Gehmaier, Johann, 4,509,562, Cl. 139-13.00R.

Geiger, Robert W.: *See*—
Tschanz, August E.; and Geiger, Robert W., 4,509,387, Cl. 74-505.000.

Geisthardt, Alan C., to Jack Walters & Sons Corp. Horizontally sliding door. 4,509,291, Cl. 49-409.000.

Gejl-Hansen, Frederik, to Nestec S.A. Process for preparing a rehydratable diced frozen food product. 4,510,163, Cl. 426-241.000.

Gemma, Mario: *See*—
Rossi, Guglielmo; and Gemma, Mario, 4,510,480, Cl. 337-321.000.

General Electric Company: *See*—
Bonneau, Paul; Holshouser, Howard E.; and Rogers, Terrence E., 4,510,623, Cl. 455-181.000.
Boothman, David R., 4,510,548, Cl. 361-25.000.
Cushing, Donald S., 4,509,687, Cl. 239-245.000.
Donaldson, Charles W., 4,509,265, Cl. 33-174.0PA.
Dougherty, John J., 4,510,611, Cl. 375-8.000.
Elton, Richard K., 4,510,077, Cl. 252-502.000.
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., 4,510,289, Cl. 525-148.000.
Griffin, James R.; and White, James A., 4,509,335, Cl. 62-77.000.
Lee, Lester H.; Johnson, Kathryn M.; and Jones, Richard W., 4,509,238, Cl. 29-156.80R.
Miller, Matthew S., 4,510,362, Cl. 219-10.55E.
Ulug, Mehmet E., 4,510,599, Cl. 370-85.000.

General Foods Corporation: *See*—
Hartl, Carroll P., 4,509,311, Cl. 53-202.000.

General Hospital Corporation, The: *See*—
Donahoe, Patricia K.; Budzik, Gerald P.; and Swann, David A., 4,510,131, Cl. 424-105.000.

General Motors Corporation: *See*—
Ament, Frank; Peden, Richard A.; and Ausen, John E., 4,509,478, Cl. 123-339.000.
Arndt, Frederick P., 4,509,775, Cl. 280-779.000.
Baynes, Gene P.; and Melinat, Wolfgang, 4,509,619, Cl. 188-73.390.
Bogosoff, John P., 4,509,789, Cl. 296-37.200.
Bryson, Bruce A.; and Buschur, Jeffrey J., 4,509,878, Cl. 403-71.000.
Colautti, Albert J.; and Borlinghaus, Hans J., 4,509,382, Cl. 74-424.80R.
Dick, Melvin E.; and Peterson, Linn A., 4,509,781, Cl. 293-104.000.
Dimick, David L.; Bly, Kenneth B.; and Ludecke, Otto A., 4,509,966, Cl. 55-502.000.
Gertiser, Kevin M., 4,509,484, Cl. 123-436.000.
Gregg, Willard W., 4,509,786, Cl. 296-1.00S.
Griffin, Michael D.; Gural, John A.; and Lamirande, Donald J., 4,509,720, Cl. 251-308.000.
Hahn, Sangman, 4,509,553, Cl. 137-596.000.
Hamparian, Nshan, 4,509,473, Cl. 123-188.0SC.
Harrison, Bobby J.; and Ashurkoff, Peter, 4,509,567, Cl. 141-97.000.
Kade, Alexander; and Karadsheh, Sam M., 4,509,611, Cl. 180-79.100.
Kimberlin, Dan R., 4,509,386, Cl. 74-492.000.
Klusman, Steven A., 4,509,804, Cl. 384-99.000.
Pirrallo, Frank G., 4,509,579, Cl. 164-159.000.
Shaw, Daniel, 4,509,578, Cl. 164-155.000.

General Signal Corporation: *See*—
Newton, Ronald O.; and Wright, Eric, 4,509,801, Cl. 303-8.000.

General Technology Applications, Inc.: *See*—
Hadermann, Albert F., 4,510,304, Cl. 528-481.000.

Genetic Diagnostics Corporation: *See*—
Platt, Herbert; and Stracher, Alfred, 4,510,130, Cl. 514-2.000.

George, E. Victor; and Schipper, John F., to United States of America, Energy. Dual frequency optical cavity. 4,510,605, Cl. 372-23.000.

Georgia Tech Research Corporation: *See*—
Tedder, Daniel W., 4,510,242, Cl. 435-157.000.

Geosource Inc.: *See*—
Mayo, Franklin W.; and Smither, Miles A., 4,510,585, Cl. 367-43.000.

Gerbellot-Barrillon, Pierre, to Fabrications Automatiques Gerbelot. Articulator for the dental art. 4,509,919, Cl. 433-57.000.

Gerber, Arthur M., to Polaroid Corporation. Optical data storage element. 4,510,232, Cl. 430-494.000.

Germann, Albrecht J., to De la Rue Giori S.A. Convertible, multicolor, rotary printing press. 4,509,424, Cl. 101-177.000.

Gertiser, Kevin M., to General Motors Corporation. Closed loop lean air/fuel ratio controller. 4,509,484, Cl. 123-436.000.

Geselchen, Paul D.; and Shuman, Robert T., to Eli Lilly and Company. Pharmacologically active peptides. 4,510,082, Cl. 260-112.50R.

Gewerkschaft Eisenhutte Westfalia: *See*—
Roling, Franz, 4,509,799, Cl. 299-42.000.

Giguere, Noelli. Bushwood mowing apparatus. 4,509,315, Cl. 56-10.700.

Gimpel, Jurgen; Jackel, Klaus-Peter; and Sander, Hans, to BASF Aktiengesellschaft. High solids baking finishes. 4,510,284, Cl. 524-379.000.

Giner-Sorolla, Alfredo: *See*—
Hadden, John W.; Simon, Lionel N.; and Giner-Sorolla, Alfredo, 4,510,144, Cl. 514-257.000.

Ginter, Sally P.: *See*—
Pawloski, Chester E.; and Ginter, Sally P., 4,510,101, Cl. 260-928.000.

Giovanni, Serafini. Sunshade fitting convertible into veranda curtain fitting. 4,509,576, Cl. 160-66.000.

Girard, Leroy. Christmas tree ornament. 4,510,189, Cl. 428-19.000.

Girton, Virgil M.; Marason, Gabriel, Jr.; and Wang, Lawrence C., to Mattel, Inc. Pull string inertial voice unit. 4,510,590, Cl. 369-63.000.

Glance, Bernard; and Greenstein, Lawrence J., to AT&T Bell Laboratories. Modified time-division transmission technique for digital mobile radio systems. 4,510,595, Cl. 370-32.000.

Glaser, Hans J., to Interpane Entwicklungs-und Beratungsgesellschaft mgH & Co. K.G. Transparent, heat-insulating coating for a transparent substrate. 4,510,190, Cl. 428-34.000.

Glaxo Group Limited: *See*—
Strachan, William S.; and Brodie, Alastair C., 4,510,312, Cl. 548-194.000.

Glembin, Dirk; Huhn, Kurt; Meyer, Gunter; and Thallmeier, Manfred, to Dynamit Nobel Aktiengesellschaft. Method of preparing alkalihalide free oligomeric, brominous xylylene bisphenol ethers. 4,510,334, Cl. 568-643.000.

GNB Batteries Inc.: *See*—
Sabatino, Anthony; Stanefski, Eugene F.; Romanchuk, Ronald N.; and Schaumburg, Edward G., 4,509,252, Cl. 29-623.100.

Gockler, Heinz; and Scheuermann, Helmut, to Licentia Patent-Verwaltungs-GmbH. Digital transmultiplexer. 4,510,598, Cl. 370-50.000.

Godbois, Arthur G. Diverting roller system. 4,509,636, Cl. 198-372.000.

Goganov, Dmitry A.; and Ovchinnikov, Evgeny K., to NPO "Burevestnik". Gas-discharge position-sensitive ionizing-radiation detector. 4,510,391, Cl. 250-374.000.

Gohda, Osamu: *See*—
Fujikawa, Katsuhiro; and Gohda, Osamu, 4,509,445, Cl. 112-317.000.

Goi, Kowichi: *See*—
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; , Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.

Gokcen, Cem; and Williams, Robert J., to Baxter Travenol Laboratories, Inc. Method for forming layered thermoplastic articles. 4,510,115, Cl. 264-515.000.

Goldfarb, Adolph E.; and Everitt, Delmar K., to Goldfarb, Adolph E. Target structure. 4,509,760, Cl. 273-380.000.

Goll, Werner, to SKW Trostberg Aktiengesellschaft. Aqueous dispersions for coating materials. 4,510,282, Cl. 524-337.000.

Golub, Gregory J., to Westinghouse Electric Corp. Circuit breaker with arc shield. 4,510,360, Cl. 200-151.000.

Gonda, Michihiro: *See*—
Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, 4,510,513, Cl. 346-214.000.

Goodall, Donald T. Pouring device. 4,509,665, Cl. 222-478.000.

Goodfellow, Anthony G., to W & A Bates Limited. Manufacture of pneumatic tires. 4,510,002, Cl. 156-126.000.

Goodrich, David G., to Kaiser Aluminum & Chemical Corporation. Bottom block. 4,509,580, Cl. 164-445.000.

Goodyear Tire & Rubber Company, The: *See*—
Houck, Richard C.; and Lundell, Dennis A., 4,509,244, Cl. 29-516.000.
Rogister, Carl, 4,509,317, Cl. 57-58.320.
Scheiderich, Robert F.; and Comper, Louis F., 4,509,984, Cl. 106-38.220.

Gopikanth, Mysore L.; Kuo, Han C.; and Schlaikjer, Carl R., to Duracell Inc. Cell with $PbCl_2$ cathode. 4,510,220, Cl. 429-225.000.

Gordon, Gary B. Machine tool readout with automatic cutter radius offset. 4,510,566, Cl. 364-190.000.

Gore, Jacques: *See*—
Bluthe, Norbert; Gore, Jacques; and Malacria, Max, 4,510,330, Cl. 568-403.000.

Gorin, Brian A.; and Ho, Ping-Pei, to NCR Corporation. Process for making high efficiency phase holograms. 4,510,221, Cl. 430-1.000.

Gorin, Brian A.: *See*—
Ho, Ping-Pei; Gorin, Brian A.; and Bora, Nayana S., 4,509,817, Cl. 350-3.610.

Gormez, Alan, to Westland plc. Helicopter rotors. 4,509,898, Cl. 416-2.000.

Gorog, Sandor: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.

Gosciniak, Guy; Juillard, Yves; Menissier, Pierre; and Moessinger, Albert, to Mecaniques de Mulhouse Societe Alsacienne de Constructions. Device for the insertion of a weft thread into the shed between two lines of warp thread in a weaving loom. 4,509,563, Cl. 139-443.000.

Goto, Hiroshi; and Tabata, Akira, to Fujitsu Ltd. Method for fabricating isolation region in semiconductor devices. 4,509,249, Cl. 29-576.00W.

Gotoh, Yoshihisa: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; and Yokote, Sachio, 4,510,079, Cl. 252-511.000.

Gottschalk, Robert E., to Panavision, Incorporated. Electronic cinema camera. 4,510,529, Cl. 358-224.000.

Gould, Eugene J. Condensation elimination tank. 4,509,338, Cl. 62-288.000.

Govang, James A.; Mee, William W.; and de Gruchy, Robert S., to Stanley Works, The. Merchandising display system and components therefor. 4,509,648, Cl. 211-70.600.

Govil, Alok K.: *See*—
Kabacoff, Bernard L.; and Govil, Alok K., 4,510,250, Cl. 436-63.000.

Graff, Roderich W. Method and apparatus for drying moist exhaust air from one or more bulk material drying hoppers. 4,509,272, Cl. 34-27.000.

Graham, Anne M.: *See*—
Pesa, Frederick A.; and Graham, Anne M., 4,510,320, Cl. 560-265.000.

Graham, Samuel L.: *See*—
Smith, Robert L.; and Graham, Samuel L., 4,510,155, Cl. 514-276.000.

Graindorge, Philippe: *See*—
Arditty, Herve ; Bourbin, Yannic; Dubos, Jacques; Gautnier, Francis; and Graindorge, Philippe, 4,509,968, Cl. 65-10.100.

Grall, Georges; Joseph, Jacques; and Lemoine, Claude, to Thomson-CSF. Array system with high resolving power. 4,510,586, Cl. 367-87.000.

Granberg, Carl-Gustav; and Kauppi, Heikki, to MKT-tehtaat Oy. Procedure for treating curd particles and cheese mould for applying the procedure. 4,509,413, Cl. 99-453.000.

Grapha-Holding AG: *See*—
Grunder, Roland, 4,509,703, Cl. 242-59.000.

Grasso, Albert P., to United States of America, National Aeronautics and Space Administration. Reactant pressure differential control for fuel cell gases. 4,509,548, Cl. 137-99.000.

Grau, Richard: *See*—
Vanderlaan, Robert D.; and Grau, Richard, 4,510,403, Cl. 310-36.000.

Graves, J. W.: *See*—
Cook, John, 4,510,358, Cl. 200-81.00R.

Gray, Reed A.; and Joo, Grant K., to Stauffer Chemical Company. S-n-Butyl-N,N-diisopropyl thiocarbamate as a selective herbicide in cotton. 4,509,974, Cl. 71-100.000.

Graziani, Gabriele: *See*—
Nardi, Dante; Catto, Alberto; Tajana, Alberto; Cazzulani, Pietro; and Graziani, Gabriele, 4,510,140, Cl. 544-360.000.

Greaves, Milton P., Jr.: *See*—
Woodward, Oakley M., Jr.; and Greaves, Milton P., Jr., 4,510,501, Cl. 343-742.000.

Greek Powder and Cartridge Co., S.A.: *See*—
Tsiriggakis, Theodoros, 4,509,388, Cl. 74-650.000.

Green, Harold V.; Fox, Thomas J.; and Scallan, Anthony M., to Pulp and Paper Research Institute of Canada. Lumen-loaded paper pulp, its production and use. 4,510,020, Cl. 162-169.000.

Greenberger, William, to Hopp Press, The. Interchangeable digital display sign. 4,509,279, Cl. 40-447.000.

Greene & Kellogg, Inc.: *See*—
McCombs, Norman R., 4,509,959, Cl. 55-161.000.

Greene, Peter D.; and Turley, Stephen E. H., to International Standard Electric Corporation. Injection laser manufacture. 4,509,996, Cl. 148-171.000.

Greenhalgh, Wilbur O., to United States of America, Energy. Recoverable immobilization of transuranic elements in sulfate ash. 4,509,978, Cl. 75-84.10R.

Greenstein, Lawrence J.: *See*—
Glance, Bernard; and Greenstein, Lawrence J., 4,510,595, Cl. 370-32.000.

Gregg, Willard W., to General Motors Corporation. Support for collapsible drag reducer. 4,509,786, Cl. 296-1.00S.

Gregory, Lee W., to Marvel Specialty Company. Acoustical shield assembly for a sewing machine. 4,509,442, Cl. 112-261.000.

Gress, Josef: *See*—
Mehlan, Bernd; and Gress, Josef, 4,509,339, Cl. 62-450.000.

Grewal, Gurbachan S.: *See*—
Gyi, Ko K.; and Grewal, Gurbachan S., 4,509,251, Cl. 29-603.000.

Griffin, James R.; and White, James A., to General Electric Company. Pre-assembled cooling and air circulating module for a household refrigerator. 4,509,335, Cl. 62-77.000.

Griffin, Michael D.; Gural, John A.; and Lamirande, Donald J., to General Motors Corporation. Valve shaft end float control. 4,509,720, Cl. 251-308.000.

Griffin, Robert F., Jr.: *See*—
Manciocchi, William D., Jr., 4,509,541, Cl. 132-90.000.

Griffiths, Richard J. M.: *See*—
Cockayne, Brian; Griffiths, Richard J. M.; and Wright, Peter J., 4,509,997, Cl. 148-175.000.

Grimbleby, James B.; and Talbot, Christopher G., to National Research Development Corporation. Automatic focusing device with frequency weighted amplification. 4,510,384, Cl. 250-201.000.

Grimmer, Horst: *See*—
Oellig, Oskar; Grimmer, Horst; and Lunz, Alfred-Gunther, 4,509,864, Cl. 368-108.000.

Gringer, Donald. Knife handle for accommodating different adjustable blade types. 4,509,260, Cl. 30-162.000.

Grogg, Terry W.; Bugaj, Joseph E.; and Bates, Paul E., to Mallinckrodt, Inc. Process for making lyophilized radiographic imaging kit. 4,510,125, Cl. 424-1.100.

Grondalen, Svein, to Moss Rosenberg Verft A/S. Insulation embodiment in a wedge-shaped space between two structural members. 4,509,657, Cl. 220-436.000.

Grotz, Bernard J., to C F Braun & Co. Temperature controlled ammonia synthesis process. 4,510,123, Cl. 423-360.000.

Grozinger, Wilhelm: *See*—
Breuser, Erich; Grozinger, Wilhelm; Latsch, Reinhard; and Wurfel, Gernot, 4,509,476, Cl. 123-266.000.

Gruenenthal GmbH: *See—*
Boehlke, Horst R. E.; Loschen, Gerriet K. H.; Michel, Gudrun E.; and Muller, Bernd, 4,510,323, Cl. 514-530.000.

Grumman Aerospace Corporation: *See—*
Walz, George A.; and Kump, Donald H., 4,510,583, Cl. 364-900.000.

Grunder, Roland, to Grapha-Holding AG. Method and apparatus for transporting and storing partially overlapping sheets. 4,509,703, Cl. 242-59.000.

GTE Automatic Electric Inc.: *See—*
Edwards, Ivan L.; McLaughlin, Robert C.; and Macrander, Max S., 4,510,462, Cl. 331-1.00A.

GTE Communication Systems Corporation: *See—*
Chang, Chieh; and Lee, Man S., 4,510,467, Cl. 332-31.00R.

GTE Laboratories: *See—*
Chi, Jim-Yong; and Holmstrom, Roger P., 4,510,016, Cl. 156-643.000.

GTE Laboratories, Inc.: *See—*
Lee, Kang I.; and Jopson, Harriet, 4,510,075, Cl. 252-500.000.
Lee, Kang I.; and Jopson, Harriet, 4,510,076, Cl. 252-500.000.

GTE Lenkurt Incorporated: *See—*
Chang, Chieh; and Lee, Man S., 4,510,466, Cl. 332-31.00R.

GTE Products Corporation: *See—*
Anderson, John W., Jr.; and Roche, William J., 4,510,418, Cl. 315-73.000.
Meade, Steven L.; Morris, Merle E.; and Rice, Lawrence M., 4,510,416, Cl. 313-579.000.
Morris, Merle E.; Meade, Steven L.; and Rice, Lawrence M., 4,509,928, Cl. 445-27.000.

GTE Valeron Corporation: *See—*
Cusack, Robert F., 4,509,266, Cl. 33-174.00L.

Guardian Products Company, Inc.: *See—*
Smith, Alfred A., 4,509,741, Cl. 272-69.000.

Guertin, Joseph R., to United Technologies Corporation. Means for refacing a fuel nozzle and method thereof. 4,509,299, Cl. 51-237.00R.

Guggenmos, Johannes: *See—*
Minner, Willy; Krappel, Alfred; and Guggenmos, Johannes, 4,509,482, Cl. 123-418.000.

Guinard, Pierre, to Freyssinet International (STUP). Device for connecting isostatic elements in line. 4,509,305, Cl. 52-223.00R.

Guisinger, Barrett E., to Sony Corporation. Wideband record amplifier. 4,510,459, Cl. 330-265.000.

Guittet, Jack; Marchal, Paul; Micaelli, Alain; and Vertut, Jean, to Commissariat a l'Energie Atomique. Servosystem between a master actuator and a slave actuator. 4,510,574, Cl. 364-513.000.

Gunnewig, Hubert, to Westfalia Separator AG. Fully jacketed centrifuge with a helical conveyor. 4,509,942, Cl. 494-53.000.

Gural, John A.: *See—*
Griffin, Michael D.; Gural, John A.; and Lamirande, Donald J., 4,509,720, Cl. 251-308.000.

Gurtler, Richard W.: *See—*
Ellis, Ralph J.; Gurtler, Richard W.; and Sarma, Kalluri R., 4,510,015, Cl. 156-617.00R.

Guterman, Daniel C.: *See—*
Dias, Donald R.; Guterman, Daniel C.; Proebsting, Robert J.; and Leuschner, Horst, 4,510,584, Cl. 365-203.000.

Gutman, Gustav, to Minnesota Mining and Manufacturing Company. Thermally generated toning agent system for photothermographic imaging compositions. 4,510,236, Cl. 430-619.000.

Guttinger, Peter: *See—*
Langen, Marinus J. M.; and Guttinger, Peter, 4,509,309, Cl. 53-142.000.

Gyi, Ko K.; and Grewal, Gurbachan S., to Magnetic Information Technology, Inc. Apparatus and method for orienting a magnetic gap in a slider head in a carriage. 4,509,251, Cl. 29-603.000.

H. D. Hudson Manufacturing Company: *See—*
Petersen, Walter E., 4,509,664, Cl. 222-402.000.

H. J. Langen & Sons Limited: *See—*
Langen, Marinus J. M.; and Guttinger, Peter, 4,509,309, Cl. 53-142.000.

Haack, Johannes, to Feintool AG Lyss. Process for precision cutting. 4,509,395, Cl. 83-55.000.

Haacker, Heinz: *See—*
Vollhardt, Frohmut; and Haacker, Heinz, 4,509,463, Cl. 122-7.00R.

Haas, Gunther: *See—*
Eidenschink, Rudolf; Haas, Gunther; Pohl, Ludwig; Romer, Michael; Scheuble, Bernhard; and Weber, Georg, 4,510,069, Cl. 252-299.610.

Haas, Roger A.: *See—*
Prosnitz, Donald; and Haas, Roger A., 4,510,455, Cl. 330-4.300.

Hachisu, Takeshi; Taguchi, Keiji; Sasaki, Toshimi; Matsumoto, Tetsuo; and Hidao, Nobuyoshi, to Hitachi, Ltd.; and Hitachi Const. Machinery Co. Method and apparatus for quenching. 4,509,995, Cl. 148-143.000.

Hackard, Roger G.: *See—*
Foster, Randy C.; Hackard, Roger G.; and Wilson, Leslie B., 4,509,935, Cl. 474-138.000.

Hada, Takashi; Kanamaru, Tatsuya; and Ogawa, Yutaka, to Nippon Steel Corporation. Two layer-coated steel materials and process for producing the same. 4,510,209, Cl. 428-659.000.

Hadden, John W.; Simon, Lionel N.; and Giner-Sorolla, Alfredo, to Newport Pharmaceuticals International. Methods of imparting immunomodulating activity with dihydrothiazolo purine derivatives. 4,510,144, Cl. 514-257.000.

Hadermann, Albert F., to General Technology Applications, Inc. Polymer fractionation. 4,510,304, Cl. 528-481.000.

Haeno, Akira: *See—*
Sato, Tetsuo; Kominami, Yasuo; Takizawa, Yoshiyuki; and Haeno, Akira, 4,510,458, Cl. 330-260.000.

Haga, Ryoichi; Ishida, Masahiko; and Odawara, Yoji, to Agency of Industrial Science and Technology, The. Anaerobic digestion process of wastes containing cellulose. 4,510,243, Cl. 435-167.000.

Hagmann, Peter: *See—*
Artusi, Aldo; and Hagmann, Peter, 4,510,014, Cl. 156-522.000.

Hahn, Sangman, to General Motors Corporation. Fluid flow selector valve. 4,509,553, Cl. 137-596.000.

Hahn, Ulrich; Straube, Peter; and Koch, Michael, to VEB Kombinat Polygraph "Werner Lamberz" Leipzig. Arrangement for adjusting the cylinders in rotary printing presses. 4,509,425, Cl. 101-216.000.

Hajdu, Istvan: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.

Hajto, Ernest A., to Du Pont Canada Inc. Emulsion blasting agent with amine-based emulsifier. 4,509,998, Cl. 149-2.000.

Hakamata, Kazuo; Takagi, Tadao; and Hyodo, Yukio, to Nippon Kogaku K.K. Drive circuit for surface-wave driven motor utilizing ultrasonic vibration. 4,510,411, Cl. 310-316.000.

Halbig, James K.: *See—*
Phillips, John R.; Halbig, James K.; Menlove, Howard O.; and Klosterbuer, Shirley F., 4,510,117, Cl. 376-257.000.

Haldex AB: *See—*
Wallqvist, Sven; and Sund, Rune, 4,510,379, Cl. 235-95.00C.

Hall, Charles B., to Outboard Marine Corporation. Control system for torque correcting device. 4,509,924, Cl. 440-51.000.

Hall, Robert N.: *See—*
Carlson, Franklin B.; and Hall, Robert N., 4,509,589, Cl. 165-95.000.

Hall, Steven J.: *See—*
Manciocchi, William D., Jr., 4,509,541, Cl. 132-90.000.

Hall, Thomas E.: *See—*
Boyce, William C.; Wittekind, Warren D.; Howard, Leroy C.; Hall, Thomas E.; and Lechelt, Wayne M., 4,510,573, Cl. 364-498.000.

Hallmark Cards, Inc.: *See—*
Otto, Stanley W.; Rhoads, Jack G.; and Scrivan, Michel A., 4,509,825, Cl. 350-259.000.

Hamada, Takuji: *See—*
Mizokawa, Sadao; Hamada, Takuji; Tomizawa, Hiroshi; and Fushimi, Hitoshi, 4,510,494, Cl. 340-825.050.

Hammerle AG Maschinenfabrik: *See—*
Zbornik, Vaclav, 4,509,357, Cl. 72-384.000.

Hamparian, Nshan, to General Motors Corporation. Spring damper with controlled wear area. 4,509,473, Cl. 123-188.0SC.

Hancor, Inc.: *See—*
Rosenbaum, Larry A., 4,509,911, Cl. 425-532.000.

Hane, Toshioki: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,510,328, Cl. 568-32.000.

Hans, Rudiger: *See—*
Brandenstein, Manfred; Hans, Rudiger; and Kiener, Heinz, 4,509,764, Cl. 277-166.000.

Hansen, Donald W., Jr.; and Papaioannou, Stamatios, to G.D. Searle & Co. Antihypertensive tetrapeptide amides. 4,510,085, Cl. 260-112.50E.

Hansen, Herbert N. W. High efficiency internal combustion steam engine. 4,509,464, Cl. 123-1.00A.

Hanson, Bernard M.: *See—*
Boudreaux, Harry J.; Card, David C.; and Hanson, Bernard M., 4,509,600, Cl. 166-381.000.

Hanson, Derald F.: *See—*
Sherman, Randy J.; and Hanson, Derald F., 4,509,819, Cl. 350-6.700.

Hanson, Raymond: *See—*
Tout, Nigel R.; and Hanson, Raymond, 4,509,271, Cl. 34-12.000.

Hanzawa, Yoshiki, to Terumo Kabushiki Kaisha. Infusion control apparatus. 4,509,943, Cl. 604-31.000.

Hara, Noboru; Fukudome, Shinichi; Johna, Nobuo; and Nakamura, Masayoshi, to Lion Corporation. Method for granulating cationic surfactant. 4,510,073, Cl. 252-383.000.

Hardin, Philip J. Autoreversing dual axial speed ink roller. 4,509,426, Cl. 101-348.000.

Hardy, Doralyn A., personal representative: *See—*
Schramm, Arthur G., deceased; Hardy, Doralyn A., personal representative; and Shaffer, Jack C., 4,510,010, Cl. 156-383.000.

Harris Corporation: *See—*
Swanson, Hilmer I., 4,510,456, Cl. 330-10.000.
VanVonno, N. W., 4,510,518, Cl. 357-49.000.

Harrison, Bobby J.; and Ashurkoff, Peter, to General Motors Corporation. Oil filter and cap. 4,509,567, Cl. 141-97.000.

Harrison, William S., to Engelhard Corporation. Rotary furnace. 4,510,369, Cl. 219-389.000.

Hartl, Carroll P., to General Foods Corporation. Method and apparatus for loading and unloading package-forming machine. 4,509,311, Cl. 53-202.000.

Hartmann, Philip W.; Kohs, Dwight W.; Spencer, Douglas A.; and Turnbow, Garry V., to AT&T Bell Labs. Time slot assignment facilities. 4,510,596, Cl. 370-58.000.

Hartwig, Michael M., to Engelhard Corporation. Platinum/silver vanadate catalyzed diesel exhaust particulate filter. 4,510,265, Cl. 502-330.000.

Harvey, Edgar L., to Burroughs Corporation. Self-scan gas discharge display panel. 4,510,417, Cl. 313-585.000.

Harvey, Marc. Rain cover for motorcyclist's legs. 4,509,213, Cl. 2-22.000.
Harvey, Vernon B. W. Irrigation apparatus. 4,509,685, Cl. 239-186.000.
Hase, Takashi: *See*—
Fujino, Sigeo; Hase, Takashi; and Toshinai, Akio, 4,510,414, Cl. 313-468.000.
Hasegawa, Hiroshi, to Nippon Kogaku K.K. Apparatus for controlling a micro-processor unit in a camera. 4,509,843, Cl. 354-412.000.
Hasegawa, Shinichi: *See*—
Kajita, Masaki; Nakaya, Tomio; Hasegawa, Shinichi; and Fujita, Hisanori, 4,510,515, Cl. 357-17.000.
Hasegawa, Shumpei, to Honda Giken Kogyo Kabushiki Kaisha. Method and device for back pressure-dependent correction of air/fuel ratio for internal combustion engines. 4,509,485, Cl. 123-440.000.
Hasegawa, Shumpei; Otobe, Yutaka; Kishi, Noriyuki; and Koumura, Takashi, to Honda Giken Kogyo Kabushiki Kaisha. Fuel supply control method for an internal combustion engine, adapted to improve operational stability, etc., of the engine during operation in particular operating conditions. 4,509,489, Cl. 123-489.000.
Hatchard, William R., to Du Pont de Nemours, E. I., and Company. Adhesion activated aramid fiber. 4,510,202, Cl. 428-295.000.
Hattori, Makoto; Taguma, Akihiro; and Takeshita, Akira, to Sumitomo Chemical Company, Limited. Process for producing 1,4-diaminoanthraquinone-2-sulfonic acid. 4,510,087, Cl. 260-371.000.
Hattori, Toshihiko; Akagi, Yuji; and Kohara, Hideo, to Toyo Kogo Co., Ltd. Vane type rotary compressor having a wear resistant resin coating. 4,509,906, Cl. 418-152.000.
Haug, Walter, to Karl Kassbohrer Fahrezeugwerke GmbH. Vehicle with detachable implement. 4,509,768, Cl. 280-479.00R.
Haugen, Orville C., to Minnesota Mining and Manufacturing Company. Pressure roll cleaning system. 4,509,225, Cl. 15-256.510.
Hauni-Werke Korber & Co. KG: *See*—
Redeker, Werner; and Uhlig, Uwe, 4,509,892, Cl. 414-223.000.
Haussel, Werner; Roppelt, Gunter; and Kindermann, Robert, to Metrawatt GmbH. Digital measuring device with liquid-crystal picture screen. 4,510,444, Cl. 324-121.00R.
Hawe, Malcolm: *See*—
Farrar, David; and Hawe, Malcolm, 4,509,987, Cl. 106-308.00Q.
Hawerkamp, Manfred. Apparatus and method for producing a tube from a continuous formed extruded supporting material and a profiled material. 4,510,004, Cl. 156-143.000.
Hayakawa, Kiyoharu: *See*—
Takeuchi, Takashi; Takahashi, Hideaki; Saji, Keiichi; Kondo, Haruyoshi; and Hayakawa, Kiyoharu, 4,510,036, Cl. 204-425.000.
Hayashi, Junichi, to Yamato Scale Company, Limited. Weighing device of load cell type. 4,509,610, Cl. 177-211.000.
Hayashi, Katsumi, to Lubrizol Corporation, The. Combinations of carboxylic acylating agents substituted with olefin polymers of high and low molecular weight mono-olefins, derivatives thereof, and fuels and lubricants containing same. 4,509,955, Cl. 44-62.000.
Hayashi, Nobuaki: *See*—
Morishita, Hajime; Akagi, Motoo; Nonogaki, Saburo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,510,226, Cl. 430-144.000.
Hazama, Katashi: *See*—
Miura, Kuniaki; Shibata, Akira; Yamada, Jun; and Hazama, Katashi, 4,510,530, Cl. 358-314.000.
Head, Robert L. Modular shooting range. 4,509,301, Cl. 52-79.800.
Hearn, Dennis, to Chemical Research & Licensing Company. Transetherification method. 4,510,336, Cl. 568-697.000.
Heat and Control, Inc.: *See*—
Caridis, Andrew A.; Benson, Clark K.; and Klein, Lawrence F., 4,510,165, Cl. 426-439.000.
Heath, Gary C.: *See*—
Carney, George T.; and Heath, Gary C., 4,509,585, Cl. 165-12.000.
Hebert, Alfred M. Energy efficient damper for a furnace. 4,509,499, Cl. 126-292.000.
Heckendorn, Roland, to Ciba-Geigy Corporation. Tricyclic polyazaheterocycles for treating depression or anxiety. 4,510,141, Cl. 514-250.000.
Hegedus, Louis: *See*—
Kim, Gwan; Pereira, Carmo J.; Hegedus, Louis; and Maselli, James -M., 4,510,262, Cl. 502-304.000.
Pereira, Carmo J.; Hegedus, Louis; and Maselli, James M., 4,510,261, Cl. 502-304.000.
Pereira, Carmo J.; and Hegedus, Louis, 4,510,263, Cl. 502-314.000.
Heidelberger Druckmaschinen AG: *See*—
Muller, Hans, 4,509,939, Cl. 493-444.000.
Heiman, Gerald R.; and Fleck, Frank, to Pestcon Systems, Inc. Method and apparatus for fumigating grain and other commodities in bulk storage compartments. 4,509,682, Cl. 239-60.000.
Heimel, Helmut; Schlosser, Willy; and Luttenberger, Alfred, to Maschinenfabrik Andritz Actiengesellschaft. Equipment for drying lengths of materials. 4,509,274, Cl. 34-114.000.
Heitmann, Peter: *See*—
Volz, Karl; Link, Christoph; Stotz, Wolf-Gunter; and Heitmann, Peter, 4,509,237, Cl. 29-116.0AD.
Hellgren, Leroy L., to United States of America, Navy. High voltage, gas tight connector. 4,509,808, Cl. 339-17.00R.
Henri, Charcosset: *See*—
Simone, Pregermain; Henri, Charcosset; and Michele, Andres, 4,510,039, Cl. 208-10.000.
Hercules Incorporated: *See*—
Liu, Chia-Seng, 4,510,286, Cl. 525-71.000.
Hergenrother, Paul M., to United States of America, National Aeronautics and Space Administration. Phenoxy resins containing pendent ethynyl groups and cured resins obtained therefrom. 4,510,296, Cl. 525-534.000.
Hering, Bernhard: *See*—
Schweiger, Josef; and Hering, Bernhard, 4,510,473, Cl. 335-86.000.
Hermann Berstorff Maschinenbau GmbH: *See*—
Koch, Klaus; Schaeffer, Hans-Joachim; and Syrbius, Gerhard, 4,509,419, Cl. 100-117.000.
Hermanns, Bernd: *See*—
Michalak, Stanislaw; and Hermanns, Bernd, 4,509,584, Cl. 165-10.000.
Herpay, Andras: *See*—
Boday, Otto ; Herpay, Andras; Krajcsovics, Ferenc; Neveri, Istvan; Pete, Sandor; Pocsy, Ferenc; Szikora, Bela; and Szirmai, Endre, 4,509,434, Cl. 110-238.000.
Herzenberg, Leonard A.: *See*—
Parks, David R.; Bryan, Virginia M.; and Herzenberg, Leonard A., 4,510,244, Cl. 435-172.200.
Herzog, Klaus; and Szenger, Franz, to Carl-Zeiss-Stiftung, Heidenheim/Brenz. Play-free anti-friction bearing construction. 4,509,871, Cl. 384-502.000.
Hesse, David L., to Allied Corporation. Retaining clip for holding a connector to a panel. 4,509,813, Cl. 339-91.00R.
Hetzl, Ernst: *See*—
Eibl, Johann; Hetzl, Ernst; and Linnau, Yendra, 4,510,084, Cl. 260-112.00B.
Hevey, Richard C., to Centocor, Inc. Diagnostic test bead transfer apparatus. 4,510,119, Cl. 422-71.000.
Hibino, Akira: *See*—
Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,510,233, Cl. 430-527.000.
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; Sugihara, Taisuke; Takagi, Seiji; and Sako, Kiyohide, to Asahi Kasei Kogyo Kabushiki Kaisha. 6-Quinazolinesulfonyl derivatives and process for preparation thereof. 4,510,307, Cl. 544-283.000.
Hidao, Nobuyoshi: *See*—
Hachisu, Takeshi; Taguchi, Keiji; Sasaki, Toshimi; Matsumoto, Tetsuo; and Hidao, Nobuyoshi, 4,509,995, Cl. 148-143.000.
Hieronymi, Richard: *See*—
Briner, Emil; and Hieronymi, Richard, 4,509,322, Cl. 57-333.000.
Higashikawa, Iwao; and Arikado, Tsunetoshi, to Kabushiki Kaisha Toshiba. Method for forming flattened film. 4,510,173, Cl. 427-44.000.
Higgins, George L., to Parker Chemical Company. Processes and compositions for the treatment of aluminum surfaces. 4,509,992, Cl. 148-6.270.
High, Sam; and Mast, Aquila D., to Feedmobile, Inc. Feed processing system. 4,509,862, Cl. 366-158.000.
Hikita, Michiyasu, to Kabushiki Kaisha Ishida Koki Seisakusho. Method of selecting electronic scale operating mode, and electronic scale using said method. 4,509,608, Cl. 177-1.000.
Hill, Royce W., to Micro Plastics Inc. Captive panel screw. 4,509,890, Cl. 411-337.000.
Hill, Thomas C., III: *See*—
Dickes, Eric J.; Hill, Thomas C., III; and Flegal, Robert T., 4,510,461, Cl. 331-1.00A.
Hinders-Leslies Limited: *See*—
King, Paul E.; and Wilson, Harold C. S., 4,509,944, Cl. 604-53.000.
Hipp, Martin: *See*—
Schall, Walter; Negro, Guido; Hipp, Martin; and Albrecht, Hans, 4,509,396, Cl. 83-126.000.
Hira, Yutaka; Ukai, Yoshitaka; Akuzawa, Yoshihide; Aoki, Osamu; and Shimatani, Saburo, to Tokyo Electric Co., Ltd. Apparatus for securing a typewriter. 4,509,874, Cl. 400-691.000.
Hirabayashi, Yuji, to Nissan Motor Company, Limited. Knock-free engine control system for turbocharged automotive engine. 4,509,331, Cl. 60-602.000.
Hirahara, Katsuji: *See*—
Chiu, Tony T.; Coatney, Charles W.; and Hirahara, Katsuji, 4,509,414, Cl. 99-585.000.
Hiramatsu, Akira: *See*—
Katsuma, Makoto; Hiramatsu, Akira; Arakawa, Kazuhiko; and Murakami, Hiroyasu, 4,509,848, Cl. 354-473.000.
Hirashima, Tsuneaki: *See*—
Matsubara, Yoshiharu; Hirashima, Tsuneaki; and Nishiguchi, Ikuzo, 4,510,025, Cl. 204-78.000.
Hirata, Atsumi, to Victor Company of Japan, Ltd. Rotary recording medium reproducing apparatus. 4,510,532, Cl. 358-342.000.
Hiratani, Hajime: *See*—
Nakanishi, Koichiro; and Hiratani, Hajime, 4,510,248, Cl. 435-226.000.
Hirsch, Kurt. Process and apparatus for pre-foaming synthetic plastics. 4,510,106, Cl. 264-53.000.
Hirschfeld, Tomas B., to University of California, Regents of the. Pressure-sensitive optrode. 4,509,370, Cl. 73-705.000.
Hirschmann, Ralph F.: *See*—
Blaine, Edward H.; Cragoe, Edward J., Jr.; Hirschmann, Ralph F.; Nancarrow, John F., deceased; Nancarrow, Elisabeth M., executrix; and Tobert, Jonathan A., 4,510,322, Cl. 514-255.000.
Hisaka Works, Ltd.: *See*—
Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, 4,509,592, Cl. 165-166.000.
Hitachi Chemical Company, Ltd.: *See*—
Hoshi, Ikuo; Arai, Masami; Yokochi, Kiyoshi; Miyadera, Yasuo; Fujioka, Atsushi; and Nakagawa, Takehisa, 4,510,008, Cl. 156-245.000.

Hitachi Const. Machinery Co.: *See*—
Hachisu, Takeshi; Taguchi, Keiji; Sasaki, Toshimi; Matsumoto, Tetsuo; and Hidao, Nobuyoshi, 4,509,995, Cl. 148-143.000.
Hitachi, Ltd.: *See*—
Hachisu, Takeshi; Taguchi, Keiji; Sasaki, Toshimi; Matsumoto, Tetsuo; and Hidao, Nobuyoshi, 4,509,995, Cl. 148-143.000.
Izumi, Eiichi; and Tamura, Hifumi, 4,510,387, Cl. 250-309.000.
Miura, Kuniaki; Shibata, Akira; Yamada, Jun; and Hazama, Katashi, 4,510,530, Cl. 358-314.000.
Mizokawa, Sadao; Hamada, Takuji; Tomizawa, Hiroshi; and Fushimi, Hitoshi, 4,510,494, Cl. 340-825.050.
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, 4,510,492, Cl. 340-825.050.
Morishita, Hajime; Akagi, Motoo; Nonogaki, Saburo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,510,226, Cl. 430-144.000.
Okunaka, Masaaki; Mizukoshi, Katsuro; Hongo, Mikio; and Miyauchi, Tateoki, 4,510,222, Cl. 430-5.000.
Sasamoto, Asao, 4,510,541, Cl. 360-97.000.
Sato, Tetsuo; Kominami, Yasuo; Takizawa, Yoshiyuki; and Haeno, Akira, 4,510,458, Cl. 330-260.000.
Suzuki, Akio; Akiyama, Mitsuo; Uzuhashi, Hideo; Ochiai, Izumi; Yamashita, Hitoshi; Sekine, Youji; Matsui, Katsuo; and Tomita, Syuji, 4,509,354, Cl. 72-294.000.
Takeshita, Masatoshi; Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,510,231, Cl. 430-312.000.
Tomite, Tosio, 4,510,407, Cl. 310-154.000.
Yabe, Minoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, 4,510,413, Cl. 313-460.000.
Yuhara, Akitsuna; Nate, Kazuo; Toyama, Tatsuro; and Yamada, Jun, 4,510,410, Cl. 310-313.00D.
Hitchcock, Robert F.: *See*—
Mullally, Charles J.; Brown, Steven L.; Anderson, David L.; and Hitchcock, Robert F., 4,509,340, Cl. 62-503.000.
Ho, Ping-Pei; Gorin, Brian A.; and Bora, Nayana S., to NCR Corporation. Method for correcting volume-phase-gelatin holograms Bragg's angle deviation. 4,509,817, Cl. 350-3.610.
Ho, Ping-Pei: *See*—
Gorin, Brian A.; and Ho, Ping-Pei, 4,510,221, Cl. 430-1 000.
Hockmuth, Richard L., to Petroleum Meter & Pump Co., Inc. Differential summing mechanism. 4,509,390, Cl. 74-705.000.
Hodgson, Kenneth J.: *See*—
Inculet, Ion I.; and Hodgson, Kenneth J., 4,509,694, Cl. 239-697.000.
Hodgson, R. W. Positioning apparatus for positioning a workpiece relative to a frame of reference. 4,509,834, Cl. 350-521.000.
Hodogaya Chemical Co., Ltd.: *See*—
Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, 4,510,513, Cl. 346-214.000.
Hoechst Aktiengesellschaft: *See*—
Fuhge, Peter; Braun, Konrad; and Becker, Udo, 4,510,126, Cl. 424-3.000.
Knop, Jurgen; Sedlacek, Hans-Harald; and Seiler, Friedrich R., 4,510,129, Cl. 424-86.000.
Mohr, Dieter; and Riess, Kurt, 4,510,227, Cl. 430-175.000.
Ross, Barry C.; Johnson, Graham; and Yeomans, Michael A., 4,510,086, Cl. 260-239.00A.
Hoetjer, Jan J., to Methanol Chemie Nederland V.o.F. Manufacture of chipboard and a novel suitable bonding agent. 4,510,278, Cl. 524-14.000.
Hofer, Wolfgang: *See*—
Forster, Heinz; Hofer, Wolfgang; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,509,971, Cl. 71-90.000.
Hoffman, John J.: *See*—
Trout, John F.; and Hoffman, John J., 4,509,884, Cl. 405-269.000.
Hoffman, Stella: *See*—
Lenchin, Julianne M.; Trubiano, Paolo C.; and Hoffman, Stella, 4,510,166, Cl. 426-565.000.
Hoffmann-La Roche Inc.: *See*—
Liu, Chao-Min; and Westley, John, 4,510,317, Cl. 549-343.000.
Hofling, Mats E., to Santrade Ltd. Means for connecting a male part to a female part. 4,509,887, Cl. 408-239.00R.
Hogg, James W. Locking wall hanger. 4,509,713, Cl. 248-546.000.
Hohl, Erwin: *See*—
Meyer, Rolf-Volker; Kreuder, Hans-Joachim; and Hohl, Erwin, 4,510,288, Cl. 525-111.000.
Hohne, Wolfgang: *See*—
Kolb, Gunter, deceased; Tork, Leo; and Hohne, Wolfgang, 4,510,302, Cl. 526-264.000.
Holland, Frank S.; Womersley, Peter; and Curran, John, to Manchem Limited. Production of organotin halides. 4,510,095, Cl. 260-429.700.
Holmstrom, Roger P.: *See*—
Chi, Jim-Yong; and Holmstrom, Roger P., 4,510,016, Cl. 156-643.000.
Holshouser, Howard E.: *See*—
Bonneau, Paul; Holshouser, Howard E.; and Rogers, Terrence E., 4,510,623, Cl. 455-181.000.
Holzapfel, Georg; and Lesz, Jan, to Holzapfel, Georg Dr. Method of manufacturing a thin layer detector for an integrating solid state dosimeter. 4,510,174, Cl. 427-65.000.
Holzapfel, Georg Dr.: *See*—
Holzapfel, Georg; and Lesz, Jan, 4,510,174, Cl. 427-65.000.
Holzer, Walter. Thermo-electric responsive device. 4,509,328, Cl. 60-528.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Hasegawa, Shumpei, 4,509,485, Cl. 123-440.000.
Hasegawa, Shumpei; Otobe, Yutaka; Kishi, Noriyuki; and Koumura, Takashi, 4,509,489, Cl. 123-489.000.
Yamaguchi, Ken, 4,509,613, Cl. 180-219.000.
Honda, Makoto: *See*—
Moriguchi, Yutaro; Honda, Makoto; and Izawa, Akira, 4,509,823, Cl. 350-128.000.
Honeywell Inc.: *See*—
Culp, Charles H.; and Downar, Denise J., 4,510,398, Cl. 307-35.000.
MacArthur, J. Ward; and Radomski, James V., 4,510,576, Cl. 364-551.000.
Wamstad, David B., 4,509,880, Cl. 403-179.000.
Hong, Chung-Yieh: *See*—
Jan, Ping-Shuenn; and Hong, Chung-Yieh, 4,509,788, Cl. 296-24.00R.
Hongo, Mikio: *See*—
Okunaka, Masaaki; Mizukoshi, Katsuro; Hongo, Mikio; and Miyauchi, Tateoki, 4,510,222, Cl. 430-5.000.
Hongou, Hiroshi: *See*—
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.
Honjo, Katsuhiko; Taki, Hiromitsu; and Sato, Noriya, to Matsushita Electric Industrial Co., Ltd. Electrode on heat-resisting and isolating substrate and the manufacturing process for it. 4,510,179, Cl. 427-96.000.
Hood, Edwin I. Fish trolling device. 4,509,287, Cl. 43-19.200.
Hook, Clarence L. Massage tread for human skin. 4,509,510, Cl. 128-25.00R.
Hoover Universal, Inc.: *See*—
Blevins, Theodore J.; and Swiderski, Paul R., 4,509,216, Cl. 5-13.000.
Hooykaas, Carel W. J., to Pelt & Hooykaas B.V. Composition obtained by mixing fly ash, oxisludge and phosphogypsum. 4,509,986, Cl. 106-110.000.
Hopp Press, The: *See*—
Greenberger, William, 4,509,279, Cl. 40-447.000.
Hori, Jiro, to Kotobuki & Co.; and Hori, Jiro. Writing instrument with overflow chamber and return to supply. 4,509,876, Cl. 401-217.000.
Hori, Yutaka: *See*—
Okuno, Toshimitsu; Hori, Yutaka; Sunakawa, Makoto; and Inagaki, Sadayuki, 4,510,181, Cl. 427-142.000.
Horiba, Ltd.: *See*—
Hosokawa, Yoshinori; Tanimoto, Masahiro; and Tsuji, Katsuya, 4,510,610, Cl. 373-118.000.
Horiguchi, Akira: *See*—
Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, 4,509,592, Cl. 165-166.000.
Horike, Masanori; Furukawa, Tatsuya; Sekiya, Takuro; Ebi, Yutaka; Isayama, Takuro; and Tachiki, Masaaki, to Ricoh Company, Ltd. Ink ejection head. 4,510,509, Cl. 346-140.00R.
Horimoto, Koji: *See*—
Miura, Yoshikazu; Horimoto, Koji; and Sumida, Takenori, 4,510,273, Cl. 523-406.000.
Hornbaker, Edwin D.: *See*—
Jones, Jesse D.; and Hornbaker, Edwin D., 4,510,280, Cl. 524-178.000.
Horton, Joel R.; and Eissenberg, David M., to United States of America, Energy. Power recovery system for coal liquefaction process. 4,510,121, Cl. 422-232.000.
Hosaka, Tomiharu: *See*—
Hotta, Shu; Hosaka, Tomiharu; and Shimotsuma, Wataru, 4,510,089, Cl. 260-396.00N.
Hoshi, Ikuo; Arai, Masami; Yokochi, Kiyoshi; Miyadera, Yasuo; Fujioka, Atsushi; and Nakagawa, Takehisa, to Hitachi Chemical Company, Ltd. Continuous production of copper-clad laminate. 4,510,008, Cl. 156-245.000.
Hoshino, Mitsutoshi: *See*—
Murata, Norio; Hoshino, Mitsutoshi; and Yamakawa, Shinzo, 4,509,820, Cl. 350-96.210.
Hosiden Electronic Co. Ltd.: *See*—
Amano, Katutoshi; and Kakuta, Toshio, 4,509,811, Cl. 339-17.00F.
Hosokawa, Yoshinori; Tanimoto, Masahiro; and Tsuji, Katsuya, to Horiba, Ltd. Extractive furnace for extracting gaseous components from material samples. 4,510,610, Cl. 373-118.000.
Hotta, Masashi, to Shimano Industrial Company Limited. Portable constant temperature box. 4,509,645, Cl. 206-545.000.
Hotta, Shu; Hosaka, Tomiharu; and Shimotsuma, Wataru, to Matsushita Electric Industrial Company, Limited. Octahydrotetracyanoquinodimethane and derivatives thereof. 4,510,089, Cl. 260-396.00N.
Houck, Richard C.; and Lundell, Dennis A., to Goodyear Tire & Rubber Company, The. Air spring assembly apparatus and method. 4,509,244, Cl. 29-516.000.
Houminer, Yoram; and Podraza, Kenneth F., to Philip Morris Incorporated. Smoking compositions. 4,509,537, Cl. 131-276.000.
Hovland, Lyle W.; and Klingensmith, James D., to Aluminum Company of America. Dish antennae mounting structure. 4,510,502, Cl. 343-880.000.
Howard, Leroy C.: *See*—
Boyce, William C.; Wittekind, Warren D.; Howard, Leroy C.; Hall, Thomas E.; and Lechelt, Wayne M., 4,510,573, Cl. 364-498.000.
Howe, Clarice M.; and Mack, Audrey, to Singer Company, The. Foot leveling sewing aid and method of use. 4,509,444, Cl. 112-262.100.

HRI, Inc.: *See—*
Johanson, Edwin S.; and Schuler, Paul D., 4,510,037, Cl. 208-8.0LE.
Hruby, John O. Multi-chamber enclosure for loudspeakers. 4,509,615, Cl. 181-148.000.
HSS Industries, Inc.: *See—*
Stacy, George F., 4,509,676, Cl. 232-43.400.
Hsu, S. P. Device for automatic lock. 4,509,348, Cl. 70-131.000.
Huang, Chor; and Schlatzer, Robert K., to B. F. Goodrich Company, The. Water thickening agents consisting of copolymers of crosslinked acrylic acids and esters. 4,509,949, Cl. 586-558.000.
Hubball, John A.; and Barry, Eugene F., to Foxboro Company, The. Fused silica capillary column. 4,509,964, Cl. 55-386.000.
Huben, Clayton A.: *See—*
Morgan, Walter R.; Boniface, Edmund A.; and Huben, Clayton A., 4,509,325, Cl. 60-39.141.
Hughes Aircraft Company: *See—*
Vasudev, Prahalad K., 4,509,990, Cl. 148-1.500.
Hughes, David W.: *See—*
Paulson, Wayne M.; and Hughes, David W., 4,510,178, Cl. 427-94.000.
Hughes, Richard: *See—*
Traver, Jack L.; Palmer, C. Dale; and Hughes, Richard, 4,509,593, Cl. 166-63.000.
Huhn, Kurt: *See—*
Glembin, Dirk; Huhn, Kurt; Meyer, Gunter; and Thallmeier, Manfred, 4,510,334, Cl. 568-643.000.
Hulsmann, Hans L., to Dynamit Nobel Aktiengesellschaft. Synthetic liquid wax esters. 4,510,093, Cl. 260-410.90N.
Human Oltoanyagtermelo Es Kutato Intezet: *See—*
Bar, Vilmos; Boszormenyi, Jozsef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,510,147, Cl. 514-314.000.
Humber, Leslie G.: *See—*
Asselin, Andre A.; and Humber, Leslie G., 4,510,157, Cl. 514-411.000.
Hummel, William H.: *See—*
Young, David A.; and Hummel, William H., 4,509,770, Cl. 280-507.000.
Hunt, Thomas K., to Ford Motor Company. Internal-integral sodium return line for sodium heat engine. 4,510,210, Cl. 429-11.000.
Hunter, Larry D. Solar energy collecting system using a primary reflector based on a pyramid structure. 4,509,501, Cl. 126-439.000.
Huntsman, Lee L.: *See—*
Barnes, Stephen R.; Tarbox, Gary L.; Huntsman, Lee L.; and McLaren, Barry D., 4,509,526, Cl. 128-663.000.
Hyodo, Yukio: *See—*
Hakamata, Kazuo; Takagi, Tadao; and Hyodo, Yukio, 4,510,411, Cl. 310-316.000.
Iba, Youich; Nakahashi, Ken-ichi; and Matsubara, Masaki, to Olympus Optical Co., Ltd. Optical system for retinal cameras. 4,509,838, Cl. 354-62.000.
Ichiyama, Toshiyuki: *See—*
Yasuda, Tomio; and Ichiyama, Toshiyuki, 4,510,441, Cl. 324-96.000.
Idemitsu Kosan Co., Ltd.: *See—*
Nakanishi, Masayuki, 4,510,062, Cl. 252-45.000.
Iguchi, Yoji: *See—*
Kakumoto, Hiromi; Ihara, Shinji; Iguchi, Yoji; and Miyata, Makoto, 4,509,259, Cl. 30-34.100.
Ihara, Hirokazu: *See—*
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, 4,510,492, Cl. 340-825.050.
Ihara, Shinji: *See—*
Kakumoto, Hiromi; Ihara, Shinji; Iguchi, Yoji; and Miyata, Makoto, 4,509,259, Cl. 30-34.100.
Ihikura, Shinichi; Kanda, Kazunori; and Nakaya, Toshiharu, to Nippon Paint Co., Ltd. Novel aqueous coating composition. 4,510,275, Cl. 523-412.000.
Iida, Hideyo; Kato, Koumei; Mishuku, Toshio; and Fujimaki, Yukiko, to Taiyo Yuden Kabushiki Kaisha. Flexible insulative substrates having two glass layers at least one side thereof and a method for making such substrates. 4,510,195, Cl. 428-215.000.
Iijima, Zenshiro, to Adger Kogyo Co., Ltd. Ink composition for writing instruments. 4,509,982, Cl. 106-23.000.
Ike, Masahide; and Arita, Masashi, to Nissan Motor Company, Limited. Method of and apparatus for forming gears. 4,509,353, Cl. 72-267.000.
Ikeda, Akira. Bottom exhaust high speed boat. 4,509,927, Cl. 440-89.000.
Ikeda, Fumihiro: *See—*
Bando, Niro; Kurohara, Kazuaki; Fujima, Yasuo; Ikeda, Fumihiro; Usiro, Kenzo; and Ogasawara, Hiroyuki, 4,509,614, Cl. 180-273.000.
Ikeda, Katuaki: *See—*
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, 4,510,492, Cl. 340-825.050.
Ikeda, Kazunari: *See—*
Kawaida, Shinji; Okitsu, Yoshio; and Ikeda, Kazunari, 4,510,012, Cl. 156-415.000.
Ikemori, Keiji, to Canon Kabushiki Kaisha. High variable magnification wide angle zoom lens. 4,509,833, Cl. 350-427.000.
Ikemoto, Kazuhito; Terakura, Yukio; Miyake, Takashi; and Yamamoto, Takashi, to Toyota Jidosha Kabushiki Kaisha. Splined press fit connection in gear wheel assembly. 4,509,381, Cl. 74-413.000.
IMC Magnetics Corp.: *See—*
Lavochkin, Ronald B., 4,509,839, Cl. 357-81.000.
Immuno Aktiengesellschaft fur chemisch-medizinische Produkte: *See—*
Eibl, Johann; Hetzl, Ernst; and Linnau, Yendra, 4,510,084, Cl. 260-112.00B.
Impact Systems, Inc.: *See—*
Stephansen, Erik, 4,509,270, Cl. 34-4.000.
Imperial Chemical Industries PLC: *See—*
Baker, Alan S., 4,509,950, Cl. 44-51.000.
Crosby, John, 4,510,098, Cl. 260-465.00D.
Evans, David D., 4,510,133, Cl. 514-30.000.
Robson, Michael J., 4,510,160, Cl. 514-521.000.
Imperial Clevite Inc.: *See—*
Shtarkman, Emile M., 4,509,730, Cl. 267-35.000.
Snyder, Daniel S., 4,510,484, Cl. 340-58.000.
Imura, Shinichi: *See—*
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.
Inaba, Ritsuo; and Wasa, Kiyotaka, to Matsushita Electric Industrial Co., Ltd. Voltage measuring device. 4,510,443, Cl. 324-120.000.
Inagaki, Masaaki. Cosmetic puff. 4,509,540, Cl. 132-79.00R.
Inagaki, Sadayuki: *See—*
Okuno, Toshimitsu; Hori, Yutaka; Sunakawa, Makoto; and Inagaki, Sadayuki, 4,510,181, Cl. 427-142.000.
Inculet, Ion I.; and Hodgson, Kenneth J., to Canadian Patents & Development Limited. Cross-current airfoil electrostatic nozzle. 4,509,694, Cl. 239-697.000.
Ing. C. Olivetti & C., S.p.A.: *See—*
Costa, Armando; and Morbin, Federico, 4,510,345, Cl. 174-35.00R.
Prato, Francesco, 4,510,491, Cl. 340-792.000.
Inoue, Hiroshi: *See—*
Oda, Hidekuni; Minami, Syuji; Inoue, Hiroshi; Matsuda, Akira; and Yamamoto, Yohzoh, 4,510,303, Cl. 526-282.000.
Inoue-Japax Research Incorporated: *See—*
Inoue, Kiyoshi, 4,510,366, Cl. 219-69.00M.
Inoue, Kiyoshi, to Inoue-Japax Research Incorporated. Fluid delivery rate control TW electrical machining method and apparatus. 4,510,366, Cl. 219-69.00M.
Inoue, Setsuro; Nikaido, Koichi; and Nakagome, Makoto, to Yamato Chemical Industry Co. Ltd. Synthetic leather for motorcars having a ground fabric knitted by a plurality of strokes. 4,510,192, Cl. 428-151.000.
Inoue, Shigeo: *See—*
Nakai, Ryozo; Inoue, Shigeo; and Arai, Sumio, 4,510,074, Cl. 252-400.230.
Inoue, Takao: *See—*
Matsumura, Michio; Inoue, Takao; and Arai, Toshihiro, 4,510,031, Cl. 204-159.200.
Inoue, Tomoko: *See—*
Tsutsumi, Hisao; and Inoue, Tomoko, 4,510,070, Cl. 252-351.000.
Inoue, Yoichi, to Kabushiki Kaisha Kobe Seiko Sho. Hot isostatic pressing apparatus. 4,509,729, Cl. 266-252.000.
Inskip, Michael; and Warren, Alan, to Ti Russel Hobbs Limited. Electric immersion heater assembly for liquid heating appliances. 4,510,375, Cl. 219-328.000.
Institut Francais du Petrole: *See—*
Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve , 4,510,042, Cl. 208-59.000.
International Business Machines Corp.: *See—*
Blount, Frederick T., 4,510,582, Cl. 364-900.000.
Bux, Werner K.; Keller, Heinrich J.; and Mueller, Hans R., 4,510,493, Cl. 340-825.050.
Chang, Philip Y.; and McInroy, John W., 4,510,567, Cl. 364-300.000.
Curtis, Huntington W.; Dodge, Frederick A.; Francis, David B.; and Mizzi, John V., 4,509,530, Cl. 128-710.000.
Kumar, Ananda H.; and Schwartz, Bernard, 4,510,000, Cl. 156-89.000.
Ray, Asit K., 4,510,172, Cl. 427-38.000.
Rohrer, Gene D., 4,510,615, Cl. 382-7.000.
Taur, Yuan, 4,509,991, Cl. 148-1.500.
International Coal Refining Company: *See—*
Skinner, Ronald W.; Tao, John C.; and Znaimer, Samuel, 4,510,040, Cl. 208-10.000.
International Flavors & Fragrances Inc.: *See—*
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,510,080, Cl. 252-522.00R.
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,510,340, Cl. 568-884.000.
International Standard Electric Corporation: *See—*
Greene, Peter D.; and Turley, Stephen E. H., 4,509,996, Cl. 148-171.000.
International Telephone and Telegraph Corp.: *See—*
Randle, Ronald E.; and Milbright, Arnold M., 4,509,303, Cl. 52-98.000.
Interpane Entwicklungs-und Beratungsgesellschaft mgH & Co. K.G.: *See—*
Glaser, Hans J., 4,510,190, Cl. 428-34.000.
Inui, Masaki; and Yasui, Yasuyoshi, to Toyota Jidosha Kabushiki Kaisha. Construction for preventing wear of shift fork in transmission manipulation device for manual transmission. 4,509,385, Cl. 74-477.000.

Inui, Toshiharu: *See*—
Kurata, Masami; Inui, Toshiharu; and Ohmori, Takashi, 4,510,523, Cl. 358-75.000.
Invernizzi, Umberto: *See*—
Bernardoni, Luigi; and Invernizzi, Umberto, 4,509,466, Cl. 123-52.0MF.
Ion Tech Limited: *See*—
Franks, Joseph, 4,510,386, Cl. 250-251.000.
Ionescu, Alexandru D. Smart hand. 4,509,783, Cl. 294-88.000.
Ippolito, Ronald A.; and Dugan, Michael T., to Xerox Corporation. Communication manager. 4,509,851, Cl. 355-14.00C.
Irikura, Tsutomu, to Matsushita Electric Industrial Co., Ltd. Chip-like solid electrolyte capacitor. 4,510,554, Cl. 361-433.000.
Isayama, Takuro: *See*—
Horike, Masanori; Furukawa, Tatsuya; Sekiya, Takuro; Ebi, Yutaka; Isayama, Takuro; and Tachiki, Masaaki, 4,510,509, Cl. 346-140.00R.
Isele, Karl J., Jr.: *See*—
Davis, Kevin M.; Wahl, Timothy M.; Beckman, John A.; and Isele, Karl J., Jr., 4,509,727, Cl. 266-44.000.
Ishida, Katsuhiko: *See*—
Okamoto, Tosaku; Okimoto, Tomoyuki; and Ishida, Katsuhiko, 4,510,512, Cl. 346-209.000.
Ishida, Kohji; and Sakamoto, Masaharu, to Pioneer Electronic Corporation. Circuit having square-law transfer characteristic. 4,510,452, Cl. 328-144.000.
Ishida, Masahiko: *See*—
Haga, Ryoichi; Ishida, Masahiko; and Odawara, Yoji, 4,510,243, Cl. 435-167.000.
Ishida, Shigetoshi, to Tanaka Kogyo Company, Ltd. Ignition circuit for internal combustion engine having alternately operable high and low speed control devices. 4,509,496, Cl. 123-651.000.
Ishikawa, Norio: *See*—
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,509,842, Cl. 354-402.000.
Ishikawa, Yuji, to Canon Kabushiki Kaisha. Thermal recording apparatus. 4,510,507, Cl. 346-76.0PH.
Ishizaka, Mineo: *See*—
Kawaguchi, Toshihiro; Ishizaka, Mineo; and Doi, Hiyoshi, 4,509,568, Cl. 141-129.000.
Ishizaki, Takaharu; Kimura, Tsuneo; and Yamazaki, Shingo, to Nippon Oil and Fats Company, Ltd. Method for improving cold flow of fuel oils. 4,509,954, Cl. 44-62.000.
Iskander, Magdy F., to University of Utah. Apparatus and method for measuring the permittivity of a substance. 4,510,437, Cl. 324-61.00R.
Isoya, Toshiro: *See*—
Ohshima, Shohzo; Kusuda, Mikio; and Isoya, Toshiro, 4,510,034, Cl. 204-290.00F.
Issler, Jorg: *See*—
Betz, Dieter; and Issler, Jorg, 4,509,495, Cl. 123-643.000.
Ito, Hirosato, to Osaka Gas Company Limited. Liquid fuel combustion apparatus. 4,509,915, Cl. 431-215.000.
Ito, Hisao, to Sanyo Electric Co., Ltd. System for securing combination radio and tape recorder. 4,510,589, Cl. 369-11.000.
Ito, Kenichi: *See*—
Kato, Kiichi; Musha, Tohru; and Ito, Kenichi, 4,509,830, Cl. 350-394.000.
Ito, Kyoji: *See*—
Yomogida, Toshihiko; Suzuki, Yasuo; and Ito, Kyoji, 4,510,580, Cl. 364-900.000.
Ito, Satoru; and Endo, Masatoshi, to Diesel Kiki Company, Ltd. Fuel injection pump. 4,509,470, Cl. 123-179.00L.
Ito, Tetsuro, to Mitsubishi Denki Kabushiki Kaisha. Electric discharge machining apparatus. 4,510,364, Cl. 219-69.00G.
Itoga, Kouyu: *See*—
Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, 4,509,776, Cl. 285-55.000.
Itow, Koichiro; and Komiyama, Kunihiko, to Kabushiki Kaisha Komatsu Seisakusho. Fuel blended with alcohol for diesel engine. 4,509,953, Cl. 44-57.000.
ITT Industries, Inc.: *See*—
Blossfeld, Lothar, 4,509,250, Cl. 29-578.000.
Iwao, Osamu: *See*—
Mehada, Masashi; Yoshimura, Shozo; Yamaguchi, Kenshiro; and Iwao, Osamu, 4,510,207, Cl. 428-607.000.
Iwasawa, Teruo, to Olympus Optical Co., Ltd. Motor apparatus. 4,510,423, Cl. 318-331.000.
Iyoda, Syozo: *See*—
Ubukata, Susumu; Mizutani, Yasukazu; and Iyoda, Syozo, 4,510,481, Cl. 337-368.000.
Iyoda, Tetsuo: *See*—
Tamai, Masayoshi; Iyoda, Tetsuo; and Koizumi, Yukihisa, 4,510,504, Cl. 346-75.000.
Izawa, Akira: *See*—
Moriguchi, Yutaro; Honda, Makoto; and Izawa, Akira, 4,509,823, Cl. 350-128.000.
Izumi, Eiichi; and Tamura, Hifumi, to Hitachi, Ltd. Ion micro-analysis. 4,510,387, Cl. 250-309.000.
Jack, James M.; and Mitchell, Stanley W., to Northern Vibrator Manufacturing Limited. Apparatus for breaking up solidified material in a storage container. 4,509,701, Cl. 241-292.000.
Jack Walters & Sons Corp.: *See*—
Geisthardt, Alan C., 4,509,291, Cl. 49-409.000.
Jackel, Klaus-Peter: *See*—
Gimpel, Jurgen; Jackel, Klaus-Peter; and Sander, Hans, 4,510,284, Cl. 524-379.000.
Jackson, Carroll V., to Wm. W. Meyer & Sons, Inc. Industrial vacuum cleaner. 4,509,963, Cl. 55-324.000.
Jacobs, Arthur F.: *See*—
Kobuck, Richard M.; and Jacobs, Arthur F., 4,510,372, Cl. 219-125.110.
Jacobsen, Jan, to Meier, Walter. Optical arrangement for producing two anamorphotically compressed images correlated by an interocular base distance. 4,509,832, Cl. 350-420.000.
Jacobson, Clayton J. Super ventilator jet ski engine hood (boat). 4,509,926, Cl. 440-89.000.
Jacquin, Yves: *See*—
Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve , 4,510,042, Cl. 208-59.000.
Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, 4,510,255, Cl. 502-10.000.
Jaffe, Myron I., to Sintered Metals, Inc. Token and acceptance mechanism. 4,509,632, Cl. 194-4.00D.
Jahn, Franz: *See*—
Schmidt, Werner; and Jahn, Franz, 4,509,673, Cl. 228-212.000.
Jamiolkowski, Dennis D.: *See*—
Bezwada, Rao S.; Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,510,295, Cl. 525-437.000.
Jan, Ping-Shuenn; and Hong, Chung-Yieh. Safety arrangement in a taxi. 4,509,788, Cl. 296-24.00R.
Janome Sewing Machine Co. Ltd.: *See*—
Tamiya, Yoshimichi; and Eguchi, Yasukata, 4,509,441, Cl. 112-158.00B.
Jansen, Pierre G.: *See*—
Scholten, Carel S.; Slob, Arie; and Jansen, Pierre G., 4,510,612, Cl. 375-106.000.
Janssen, Peter J. M., to U.S. Philips Corporation. Optical disc pressure-collapsible cover. 4,510,508, Cl. 346-135.100.
Japan Chemical Research Co., Ltd.: *See*—
Nakanishi, Koichiro; and Hiratani, Hajime, 4,510,248, Cl. 435-226.000.
Japan Exlan Company Limited: *See*—
Sawanishi, Shigeru; Shiomi, Yozo; and Yamane, Akira, 4,510,111, Cl. 264-177.00F.
Japan Life Company Limited: *See*—
Yagi, Toshizo, 4,509,219, Cl. 5-481.000.
Jardin, Hans: *See*—
Bienert, Horst; Kohlpaintner, Georg; and Jardin, Hans, 4,509,791, Cl. 296-216.000.
Jensen, Susan: *See*—
Wolfe, Saul; Westlake, Donald; and Jensen, Susan, 4,510,246, Cl. 435-183.000.
Jeumont-Schneider Corporation: *See*—
Wiart, Albert; and Paeye, Gerard, 4,509,337, Cl. 62-235.100.
JGC Corporation: *See*—
Matsuoka, Hiroo; Matsuoka, Seiichi; Yamabe, Tsunekichi; Fujie, Hirokazu; Mori, Kenji; Tamura, Kouji; Yamada, Masatoshi; and Furuta, Akio, 4,510,264, Cl. 502-328.000.
Jobsky, William G.: *See*—
Wolfe, Earle C., deceased; Jobsky, William G.; and Smith, Thomas P., 4,510,487, Cl. 340-566.000.
Joh. Friedrich Behrens AG: *See*—
Elliesen, Wolfgang, 4,509,669, Cl. 227-130.000.
Johanson, Edwin S.; and Schuler, Paul D., to HRI, Inc. Hydrogenation process for solid carbonaceous feed materials using thermal countercurrent flow reaction zone. 4,510,037, Cl. 208-8.0LE.
John Fluke Mfg. Co., Inc.: *See*—
Sherman, David M., 4,510,454, Cl. 330-2.000.
John, Martin. Trawl shrimp cage. 4,509,286, Cl. 43-9.000.
Johna, Nobuo: *See*—
Hara, Noboru; Fukudome, Shinichi; Johna, Nobuo; and Nakamura, Masayoshi, 4,510,073, Cl. 252-383.000.
Johnson, Ann, Administratrix: *See*—
Johnson, Leighton C., deceased, 4,509,941, Cl. 494-45.000.
Johnson, Bruce K.; and Whiteside, George D., to Polaroid Corporation. Lens drive for auto focus camera. 4,509,840, Cl. 354-400.000.
Johnson, David C. Electronic lighting apparatus for simulating a flame. 4,510,556, Cl. 362-184.000.
Johnson, Graham: *See*—
Ross, Barry C.; Johnson, Graham; and Yeomans, Michael A., 4,510,086, Cl. 260-239.00A.
Johnson, James M., Jr., to AT&T Bell Laboratories. Loop-around testing facilities for a multiline protocol controller. 4,510,594, Cl. 370-15.000.
Johnson, Kalin S., to Colt Industries Operating Corp. Fuel injection apparatus and system. 4,509,483, Cl. 123-432.000.
Johnson, Kathryn M.: *See*—
Lee, Lester H.; Johnson, Kathryn M.; and Jones, Richard W., 4,509,238, Cl. 29-156.80R.
Johnson, Leighton C., deceased (by Johnson, Ann, Administratrix), to Miles Laboratories, Inc. Fractionation device and method. 4,509,941, Cl. 494-45.000.
Johnson, Lonnie G. Soil moisture potential determination by weight measurement. 4,509,361, Cl. 73-73.000.
Johnson Matthey, Inc.: *See*—
Enga, Bernard E., 4,509,327, Cl. 60-274.000.
Johnson Service Company: *See*—
Rudich, George, Jr., 4,510,547, Cl. 361-22.000.
Johnston, Kenneth R. Self-greasing bearing. 4,509,869, Cl. 384-462.000.
Jondahl, Joseph S. Sanitary food dispenser. 4,509,450, Cl. 118-20.000.

Jones, Donald D., to Elwood Manufacturing Company. Hydraulically actuated high torque, quick engagement clutch assembly. 4,509,626, Cl. 192-85.0AA.
Jones, Jesse D.; and Hornbaker, Edwin D., to Ethyl Corporation. Thermoplastic PVC molding compositions. 4,510,280, Cl. 524-178.000.
Jones, Richard W.: *See*—
Lee, Lester H.; Johnson, Kathryn M.; and Jones, Richard W., 4,509,238, Cl. 29-156.80R.
Jones, William H., to Armstrong Jones Inc. Air filter assembly. 4,509,961, Cl. 55-294.000.
Joo, Grant K.: *See*—
Gray, Reed A.; and Joo, Grant K., 4,509,974, Cl. 71-100.000.
Jopson, Harriet: *See*—
Lee, Kang I.; and Jopson, Harriet, 4,510,075, Cl. 252-500.000.
Lee, Kang I.; and Jopson, Harriet, 4,510,076, Cl. 252-500.000.
Jorgensen, Pierre, to British Petroleum Company p.l.c., The. Energy extraction from hot gases. 4,509,326, Cl. 60-39.182.
Joseph, Jacques: *See*—
Grall, Georges; Joseph, Jacques; and Lemoine, Claude, 4,510,586, Cl. 367-87.000.
Jost, Ernest M., to Chemet Corporation; and Chemet Corporation. Electrical contact material comprising silver, cadmium oxide and cupric salt. 4,509,980, Cl. 75-234.000.
Jovick, Raymond J.; Malott, Roger J.; and Evans, Thomas E., to Rockwell International Corporation. Mounting device for cylindrical magnetic sensor. 4,510,408, Cl. 310-168.000.
Joyal Products, Inc.: *See*—
Szantho, Charles F.; and Riordan, Edward D., 4,510,370, Cl. 219-86.250.
Joyce, Michael F. Carton with separaters, its blank and apparatus facilitating its erection for use. 4,509,640, Cl. 206-175.000.
Joyner, Richard W.; McCarroll, John J.; and Tennison, Stephen R., to British Petroleum Company p.l.c., The. Methanol conversion process. 4,510,071, Cl. 252-373.000.
Juillárd, Yves: *See*—
Gosciniak, Guy; Juillard, Yves; Menissier, Pierre; and Moessinger, Albert, 4,509,563, Cl. 139-443.000.
Junginger, Erich; Rittsmannsberger, Norbert; and Schnaibel, Eberhard, to Robert Bosch GmbH. Free-wheeling control system for a motor vehicle. 4,509,628, Cl. 192-0.094.
Juttner, Heinz: *See*—
Bottcher, Wolfgang; Juttner, Heinz; Maurer, Albrecht; and Stutzinger, Ferdinand, 4,509,295, Cl. 51-49.000.
K. R. Associates, Inc.: *See*—
Rines, Robert H.; and Knowles, Albert H., 4,509,458, Cl. 119-3.000.
Kabacoff, Bernard L.; and Govil, Alok K., to Revlon, Inc. Method of hair damage assessment. 4,510,250, Cl. 436-63.000.
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, to Bayer Aktiengesellschaft. Bisindolyl alkylene ureas lipid absorption-inhibiting agents and their use thereas. 4,510,156, Cl. 514-415.000.
Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
Hikita, Michiyasu, 4,509,608, Cl. 177-1.000.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Inoue, Yoichi, 4,509,729, Cl. 266-252.000.
Kobayashi, Minoru; Sakai, Yoshiya; Minato, Shoji; Ooe, Tsuguo; Arai, Katsumi; and Suga, Tetsuo, 4,510,374, Cl. 219-146.100.
Tanaka, Tsuyoshi; and Yoshikawa, Kazuhisa, 4,509,699, Cl. 241-268.000.
Kabushiki Kaisha Komatsu Seisakusho: *See*—
Itow, Koichiro; and Komiyama, Kunihiko, 4,509,953, Cl. 44-57.000.
Kabushiki Kaisha Meidensha: *See*—
Ando, Yasuo; and Ochiai, Toshihiko, 4,510,218, Cl. 429-198.000.
Ashikaga, Tadashi; and Terashima, Masayuki, 4,510,430, Cl. 318-800.000.
Kabushiki Kaisha Miura Kumihimo Kogyo: *See*—
Taki, Kiyozi, 4,509,870, Cl. 384-296.000.
Kabushiki Kaisha Toshiba: *See*—
Higashikawa, Iwao; and Arikado, Tsunetoshi, 4,510,173, Cl. 427-44.000.
Kabushiki Kaisha Toyota Chouo Kenkyusho: *See*—
Takeuchi, Takashi; Takahashi, Hideaki; Saji, Keiichi; Kondo, Haruyoshi; and Hayakawa, Kiyoharu, 4,510,036, Cl. 204-425.000.
Kabushiki Kaishi Meidensha: *See*—
Yaluda, Tomio; and Ichiyama, Toshiyuki, 4,510,441, Cl. 324-96.000.
Kaczynski, Donald J.: *See*—
Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased, 4,510,048, Cl. 209-3.000.
Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased, 4,510,049, Cl. 209-3.000.
Kade, Alexander; and Karadsheh, Sam M., to General Motors Corporation. Adaptive controller for electric power steering. 4,509,611, Cl. 180-79.100.
Kadoo, Fumio: *See*—
Kanamaru, Hitashi; and Kadoo, Fumio, 4,510,592, Cl. 369-270.000.
Kagami, Toshiro; and Watanabe, Kuniaki, to Toshiba Ceramics Co., Ltd. Casting nozzle. 4,510,191, Cl. 428-36.000.
Kagawa, Hiroshi; and Matsui, Kazumasa, to Yuasa Battery Co. Ltd. Sodium-sulfur storage battery. 4,510,217, Cl. 429-104.000.
Kaiser Aluminum & Chemical Corporation: *See*—
Goodrich, David G., 4,509,580, Cl. 164-445.000.
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, to Toray Industries, Inc. Apparatus for manufacturing fasciated yarn. 4,509,321, Cl. 57-328.000.
Kajita, Masaki; Nakaya, Tomio; Hasegawa, Shinichi; and Fujita, Hisanori, to Stanley Electric Co., Ltd.; and Mitsubishi Monsanto Chemical Co., Ltd. Epitaxial wafer of compound semiconductor display device. 4,510,515, Cl. 357-17.000.
Kajiwara, Makoto: *See*—
Matsuzaka, Syoji; Kajiwara, Makoto; Miyoshi, Masanobu; and Yamashita, Kiyoshi, 4,510,234, Cl. 430-557.000.
Kakl, Josef: *See*—
Schrofelbauer, Herbert; Kakl, Josef; Staudinger, Gernot; and Filipot, Hermann, 4,509,436, Cl. 110-345.000.
Kakumoto, Hiromi; Ihara, Shinji; Iguchi, Yoji; and Miyata, Makoto, to Matsushita Electric Works, Ltd. Electric shaver. 4,509,259, Cl. 30-34.100.
Kakuta, Toshio: *See*—
Amano, Katutoshi; and Kakuta, Toshio, 4,509,811, Cl. 339-17.00F.
Kaleita, David L.: *See*—
Michaels, Paul A.; and Kaleita, David L., 4,510,426, Cl. 318-565.000.
Kals, Walter, to Niagara Blower Company. Vacuum producing condenser. 4,509,591, Cl. 165-122.000.
Kanada, Eiji: *See*—
Tsubai, Yasuo; Takaya, Yoshikazu; and Kanada, Eiji, 4,510,228, Cl. 430-204.000.
Kanamaru, Hitashi; and Kadoo, Fumio, to Universal Pioneer Corporation. Disk clamping device. 4,510,592, Cl. 369-270.000.
Kanamaru, Tatsuya: *See*—
Hada, Takashi; Kanamaru, Tatsuya; and Ogawa, Yutaka, 4,510,209, Cl. 428-659.000.
Kanasugi, Mikiko: *See*—
Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, 4,510,513, Cl. 346-214.000.
Kanayama, Kenji, to Nippondenso Co., Ltd. Heat insulation and heat dissipation construction for flat electric rotary machine. 4,510,409, Cl. 310-268.000.
Kanda, Kazunori: *See*—
Ihikura, Shinichi; Kanda, Kazunori; and Nakaya, Toshiharu, 4,510,275, Cl. 523-412.000.
Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See*—
Takeuchi, Tooru; Nakamura, Masaru; and Aoishi, Eiji, 4,510,201, Cl. 428-285.000.
Kanno, Tadaaki; Ukai, Takeshi; Akahoshi, Yutaka; and Shibata, Katsuji, to Ricoh Company, Ltd. Document handling apparatus for producing folded and bound stacks of documents. 4,509,732, Cl. 270-37.000.
Kanno, Takashi; Oka, Akira; Okamoto, Ituo; Mizushima, Kouji; and Oguro, Shinji, to Fujitsu Limited. Device for housing communication circuits and equipment. 4,510,552, Cl. 361-413.000.
Kanzaka, Yoshihiro, to Nippon Notion Kogyo Co., Ltd. Attaching post for snap fastener elements. 4,509,232, Cl. 24-113.00R.
Kanzaki Paper Manufacturing Company, Limited: *See*—
Okamoto, Tosaku; Okimoto, Tomoyuki; and Ishida, Katsuhiko, 4,510,512, Cl. 346-209.000.
Kao Corporation: *See*—
Nakai, Ryozo; Inoue, Shigeo; and Arai, Sumio, 4,510,074, Cl. 252-400.230.
Nogami, Takashi; and Nawa, Masayoshi, 4,510,216, Cl. 429-101.000.
Tsutsumi, Hisao; and Inoue, Tomoko, 4,510,070, Cl. 252-351.000.
Karadsheh, Sam M.: *See*—
Kade, Alexander; and Karadsheh, Sam M., 4,509,611, Cl. 180-79.100.
Karkkainen, Jouko: *See*—
Uomala, Vilho; Karkkainen, Jouko; and Sandstrom, Kjell, 4,509,719, Cl. 251-214.000.
Karl Kassbohrer Fahrezeugwerke GmbH: *See*—
Haug, Walter, 4,509,768, Cl. 280-479.00R.
Karl Lautenschlager KG Mobelbeschlagfabrik: *See*—
Lautenschlager, Karl, Jr., 4,509,882, Cl. 403-402.000.
Karmazin Products Corporation: *See*—
Woodhull, Ivan D., Jr.; and Liedel, Thomas H., 4,509,672, Cl. 228-175.000.
Kasner, William H.: *See*—
Taylor, Lyle H.; and Kasner, William H., 4,510,604, Cl. 372-4.000.
Kassies, Michiel. Real image projection device. 4,509,837, Cl. 353-10.000.
Kastle Gesellschaft m.b.H.: *See*—
Nussbaumer, Wolfgang, 4,509,771, Cl. 280-609.000.
Kato, Kiichi; Musha, Tohru; and Ito, Kenichi, to Olympus Optical Co., Ltd. Light beam separation method. 4,509,830, Cl. 350-394.000.
Kato, Koumei: *See*—
Iida, Hideyo; Kato, Koumei; Mishuku, Toshio; and Fujimaki, Yukiko, 4,510,195, Cl. 428-215.000.
Kato, Toshikazu, to Olympus Optical Co., Ltd. Cassette ejection mechanism for a cassette tape recorder. 4,510,540, Cl. 360-93.000.
Kato, Yoshinori; Matsui, Makoto; and Nonaka, Zenichiro, to Aida Engineering, Ltd. Conveying system for press work materials. 4,509,638, Cl. 198-486.000.
Katsuma, Makoto; Hiramatsu, Akira; Arakawa, Kazuhiko; and Murakami, Hiroyasu, to Canon Kabushiki Kaisha. Light measuring device for camera. 4,509,848, Cl. 354-473.000.
Kaufmann, Robert. Educational toy for teaching alphanumeric sequences. 4,509,920, Cl. 434-159.000.
Kauppi, Heikki: *See*—
Granberg, Carl-Gustav; and Kauppi, Heikki, 4,509,413, Cl. 99-453.000.
Kawabata, Takashi: *See*—
Sakai, Shinji; and Kawabata, Takashi, 4,509,841, Cl. 354-400.000.

Kawaguchi, Toshihiro; Ishizaka, Mineo; and Doi, Hiyoshi, to Takeda Chemical Industries, Ltd. Granular material processing apparatus with seal for stirrer shaft or the like formed by the granular material. 4,509,568, Cl. 141-129.000.

Kawahara, Masakatsu; and Takeda, Masaru, to Kobe Steel, Limited. Master/slave fluid pressure apparatus. 4,509,404, Cl. 91-388.000.

Kawai, Yoichi; Gotoh, Yoshihisa; and Yokote, Sachio, to Mitsui Toatsu Chemicals, Inc. Electrically-conductive resin composition. 4,510,079, Cl. 252-511.000.

Kawaida, Shinji; Okitsu, Yoshio; and Ikeda, Kazunari, to Bridgestone Tire Co., Ltd. Tire molding apparatus. 4,510,012, Cl. 156-415.000.

Kawaida, Shinji: *See*—
Azuma, Yusaku; Kitayama, Yoshifumi; and Kawaida, Shinji, 4,510,011, Cl. 156-407.000.

Kawakami, Kinya, to Yokohama Rubber Co., Ltd., The. Rubber compositions for tire treads. 4,510,291, Cl. 525-237.000.

Kawamoto, Matsumi, to Aisin Warner Kabushiki Kaisha. Hydraulic centrifugal clutch. 4,509,627, Cl. 192-85.00F.

Kawamura, Kunio: *See*—
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,509,842, Cl. 354-402.000.

Kawamura, Takahide: *See*—
Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, 4,510,396, Cl. 290-30.00R.

Kawasaki, Hiroshi: *See*—
Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,510,233, Cl. 430-527.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See*—
Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, 4,509,776, Cl. 285-55.000.

Kawatei, Hisatsugu, to Diesel Kiki Co., Ltd. Overflow valve for distributor-type fuel injection pumps. 4,509,491, Cl. 123-502.000.

Kawazoe, Shunji: *See*—
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Satoh, Akihiro, 4,510,292, Cl. 525-247.000.

Kay, David P.: *See*—
Westwood, Robert; Miller, Peter; Ager, Ian R.; and Kay, David P., 4,510,143, Cl. 514-250.000.

Kazda, Stanislay: *See*—
Wehinger, Egbert; Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Towart, Robertson; Stoepel, Kurt; and Kazda, Stanislay, 4,510,310, Cl. 546-321.000.

Keane, James W., to Whirlpool Corporation. Three-piece swivel caster having a force transfer roller. 4,509,227, Cl. 16-23.000.

Kearney, James E.: *See*—
Anderson, Philip M., III; Bretts, Gerald R.; and Kearney, James E., 4,510,489, Cl. 340-572.000.
Anderson, Philip M., III; Kearney, James E.; and Bretts, Gerald R., 4,510,490, Cl. 340-572.000.

Kehr, Clifton L.; Wszolek, Walter R.; and Marans, Nelson S., to W. R. Grace & Co. Hindered aliphatic monoisocyanates. 4,510,097, Cl. 260-453.00A.

Keller, Heinrich J.: *See*—
Bux, Werner K.; Keller, Heinrich J.; and Mueller, Hans R., 4,510,493, Cl. 340-825.050.

Kelly Bushing Tools, Inc.: *See*—
Tullos, Homan C.; and Woods, Dewey W., 4,509,605, Cl. 175-57.000.

Kelsoe, Wayne E.: *See*—
McClanahan, John B.; LaVoie, Marvin E.; Kelsoe, Wayne E.; and Wrobel, James, 4,510,482, Cl. 338-24.000.

Kendall Company, The: *See*—
Shah, Kishore R., 4,510,197, Cl. 428-220.000.

Kennecott Corporation: *See*—
Carpenter, James H.; and Corderman, Donald G., 4,509,300, Cl. 51-435.000.

Kennedy, Thomas M.: *See*—
MacGregor, John R.; Rupert, Gary F.; and Kennedy, Thomas M., 4,510,365, Cl. 219-69.00G.

Kennedy, William S.: *See*—
Clark, Thomas S.; and Kennedy, William S., 4,509,587, Cl. 165-61.000.

Kerns, William R.: *See*—
Cooper, Merton G.; Kerns, William R.; Filley, Daniel E.; and Koschnick, Gary A., 4,509,549, Cl. 137-327.000.

Kesseli, James B.: *See*—
Nussdorfer, Theodore J.; and Kesseli, James B., 4,509,333, Cl. 60-723.000.

Khanna, Satish C., to Ciba Geigy Corporation. Resinate of a substituted carboxylic acid, the preparation and use thereof, and pharmaceutical compositions containing it. 4,510,128, Cl. 424-79.000.

Kiener, Heinz: *See*—
Brandenstein, Manfred; Hans, Rudiger; and Kiener, Heinz, 4,509,764, Cl. 277-166.000.

Killmann, Peter A., to Marsteller & Killman GmbH & Co. KG. Bottle or similar container, especially for readily combustible liquids, with a screw-on closure. 4,509,655, Cl. 215-309.000.

Kim, Gwan; Pereira, Carmo J.; Hegedus, Louis; and Maselli, James M., to W. R. Grace & Co. Doubly promoted catalyst with high geometric surface area. 4,510,262, Cl. 502-304.000.

Kim, Syng N., to Wico Corporation. Coin door assembly. 4,509,631, Cl. 194-1.00A.

Kimberlin, Dan R., to General Motors Corporation. Lash-free telescopic steering shaft assembly and method of making the assembly. 4,509,386, Cl. 74-492.000.

Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, to Asahi Kasei Kogyo Kabushiki Kaisha. Fluorinated vinyl ether compounds and process for producing the same. 4,510,328, Cl. 568-32.000.

Kimura, Takahiko: *See*—
Takao, Mitsunori; and Kimura, Takahiko, 4,509,477, Cl. 123-339.000.

Kimura, Tsuneo: *See*—
Ishizaki, Takaharu; Kimura, Tsuneo; and Yamazaki, Shingo, 4,509,954, Cl. 44-62.000.

Kindermann, Robert: *See*—
Haussel, Werner; Roppelt, Gunter; and Kindermann, Robert, 4,510,444, Cl. 324-121.00R.

King, J. Thomas: *See*—
Ataman, Ergin'; and King, J. Thomas, 4,510,618, Cl. 382-54.000.

King, Paul E.; and Wilson, Harold C. S., to Hinders-Leslies Limited. Catheter assembly. 4,509,944, Cl. 604-53.000.

King-Seeley Thermos Co.: *See*—
Nelson, Kenneth L., 4,510,114, Cl. 264-261.000.

Kingston, Samuel B.; and Evans, Graham, to Ciba Geigy AG; and Ciba Geigy AG. Photographic material and a process for its manufacture. 4,510,238, Cl. 430-627.000.

Kipp, Robert M.: *See*—
Kruka, Vitold R.; Kipp, Robert M.; and Cadena, Edward R., 4,510,588, Cl. 367-165.000.

Kirchmayr, Rudolf; and Rutsch, Werner, to Ciba Geigy Corporation. Acid-curable composition containing a masked curing catalyst, and a process for the curing thereof. 4,510,290, Cl. 525-162.000.

Kirkemo, Curtis L.; and Shipchandler, Mohammed T., to Abbott Laboratories. Fluorescent polarization assay for ligands using aminomethylfluorescein derivatives as tracers. 4,510,251, Cl. 436-536.000.

Kirkpatrick, John A.: *See*—
Budrean, John D.; and Kirkpatrick, John A., 4,509,356, Cl. 72-349.000.

Kishi, Hajimu; and Seki, Masaki, to Fanuc Ltd. Graphic processing method. 4,510,568, Cl. 364-300.000.

Kishi, Noriyuki: *See*—
Hasegawa, Shumpei; Otobe, Yutaka; Kishi, Noriyuki; and Koumura, Takashi, 4,509,489, Cl. 123-489.000.

Kishida, Kazuo; Sasaki, Isao; Mukai, Nobuhiro; and Asai, Hajime, to Mitsubishi Rayon Co., Ltd. Novel polymer composition. 4,510,024, Cl. 204-59.00R.

Kishimura, Masaaki; and Arakawa, Nobuyuki, to Mitsubishi Rayon Co., Ltd.; and Sony Corporation. Methacrylate resin composition for optical information recording medium. 4,510,279, Cl. 524-144.000.

Kitayama, Yoshifumi: *See*—
Azuma, Yusaku; Kitayama, Yoshifumi; and Kawaida, Shinji, 4,510,011, Cl. 156-407.000.

Kiteley, Kenneth J., to Zenith Electronics Corporation. Switching regulator power supply. 4,510,400, Cl. 307-66.000.

Kiya, Nobuyuki: *See*—
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Murakami, Kunihiko, 4,510,427, Cl. 318-590.000.

Klaus, Artur; and Wilhelm, Hans, to Signode Corporation. Pneumatically operable fastener driving tool. 4,509,668, Cl. 227-8.000.

Klebovich, Imre: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.

Klein, Lawrence F.: *See*—
Caridis, Andrew A.; Benson, Clark K.; and Klein, Lawrence F., 4,510,165, Cl. 426-439.000.

Kleinert, Michael; Moller, Rainer; and Stelzer, Horst, to VEB Zentrum fur Forschung und Technologie Mikroelektronik. Apparatus for guiding gas for LP CVD processes in a tube reactor. 4,509,456, Cl. 118-715.000.

Klievoneit, Harold R., to St. Florian Company, Ltd. Pneumatic clamp mounting for a disc. 4,509,298, Cl. 51-237.00R.

Kling, Alfred: *See*—
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,510,068, Cl. 252-186.290.

Klingensmith, James D.: *See*—
Hovland, Lyle W.; and Klingensmith, James D., 4,510,502, Cl. 343-880.000.

Klosterbuer, Shirley F.: *See*—
Phillips, John R.; Halbig, James K.; Menlove, Howard O.; and Klosterbuer, Shirley F., 4,510,117, Cl. 376-257.000.

Kluck, Robert S. Multi-positional handle for serographic screen. 4,509,423, Cl. 101-127.100.

Klusman, Steven A., to General Motors Corporation. Bearing mount with squeeze film damping. 4,509,804, Cl. 384-99.000.

Knaack, Howard L.; and Weger, Kenneth F., Jr., to Knaack Manufacturing Company. Truck rack. 4,509,787, Cl. 296-3.000.

Knaack Manufacturing Company: *See*—
Knaack, Howard L.; and Weger, Kenneth F., Jr., 4,509,787, Cl. 296-3.000.

Knapp, Gordon G., to Ethyl Corporation. Corrosion inhibitor for alcohol and gasohol fuels. 4,509,951, Cl. 44-53.000.

Knapp, Kenneth M. Pig featuring foam filled cavity. 4,509,222, Cl. 15-104.06R.

Knaus, Heimo A.: *See*—
Schweigert, Lothar L.; and Knaus, Heimo A., 4,509,930, Cl. 446-109.000.

Knodel, Emil; and Nonnenmacher, Gerhard, to Robert Bosch GmbH. Power regulating device for a hydrostatic pump. 4,509,902, Cl. 417-216.000.

Knop, Jurgen; Sedlacek, Hans-Harald; and Seiler, Friedrich R., to Hoechst Aktiengesellschaft. Immunostimulating agent. 4,510,129, Cl. 424-86.000.

Knowles, Albert H.; and Rines, Robert H. Process and apparatus for fish growth acceleration. 4,509,459, Cl. 119-3.000.

Knowles, Albert H.: *See*—
Rines, Robert H.; and Knowles, Albert H., 4,509,458, Cl. 119-3.000.

Kobayashi, Minoru; Sakai, Yoshiya; Minato, Shoji; Ooe, Tsuguo; Arai, Katsumi; and Suga, Tetsuo, to Kabushiki Kaisha Kobe Seiko Sho. Flux-cored wire electrode suitable for use in gas-shielded arc-welding. 4,510,374, Cl. 219-146.100.

Kobe Steel, Limited: *See*—
Kawahara, Masakatsu; and Takeda, Masaru, 4,509,404, Cl. 91-388.000.

Kobuck, Richard M.; and Jacobs, Arthur F., to Westinghouse Electric Corp. Sleeve-to-tube welder. 4,510,372, Cl. 219-125.110.

Koch, Klaus; Schaeffer, Hans-Joachim; and Syrbius, Gerhard, to Hermann Berstorff Maschinenbau GmbH. Worm press for mechanically separating liquid/solid mixtures. 4,509,419, Cl. 100-117.000.

Koch, Michael: *See*—
Hahn, Ulrich; Straube, Peter; and Koch, Michael, 4,509,425, Cl. 101-216.000.

Koch, Rolf H. L.: *See*—
Whiting, James F.; and Koch, Rolf H. L., 4,509,368, Cl. 73-624.000.

Kockums Cancar, Corp.: *See*—
Gaitten, Walden M., deceased, 4,509,574, Cl. 144-208.00E.

Kodama, Hisashi: *See*—
Arai, Fuminao; Kodama, Hisashi; and Ono, Takuro, 4,509,467, Cl. 123-90.160.

Kodama, Naoki: *See*—
Takeshita, Masatoshi; Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,510,231, Cl. 430-312.000.

Kogut, Jimmy A. Control unit for make-up and combustion air circulation. 4,509,681, Cl. 237-53.000.

Kohara, Hideo: *See*—
Hattori, Toshihiko; Akagi, Yuji; and Kohara, Hideo, 4,509,906, Cl. 418-152.000.

Kohlpaintner, Georg: *See*—
Bienert, Horst; Kohlpaintner, Georg; and Jardin, Hans, 4,509,791, Cl. 296-216.000.

Kohs, Dwight W.: *See*—
Hartmann, Philip W.; Kohs, Dwight W.; Spencer, Douglas A.; and Turnbow, Garry V., 4,510,596, Cl. 370-58.000.

Kohtaki, Takaaki: *See*—
Kubo, Yoichiro; Kohtaki, Takaaki; and Oura, Kiyomori, 4,510,293, Cl. 525-338.000.

Koizumi, Haruyuki: *See*—
Atsumi, Haruo; and Koizumi, Haruyuki, 4,510,355, Cl. 200-47.000.

Koizumi, Yukihisa: *See*—
Tamai, Masayoshi; Iyoda, Tetsuo; and Koizumi, Yukihisa, 4,510,504, Cl. 346-75.000.

Kokubo, Eiichi: *See*—
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.

Kolb, Gunter, deceased (by Kolb, Ingeborg, heiress); Tork, Leo; and Hohne, Wolfgang, to Bayer Aktiengesellschaft. Formulations and their use for pigmenting and/or delustring dressing agents for leather and leather imitations. 4,510,302, Cl. 526-264.000.

Kolb, Ingeborg, heiress: *See*—
Kolb, Gunter, deceased; Tork, Leo; and Hohne, Wolfgang, 4,510,302, Cl. 526-264.000.

Kollmorgen Technologies Corporation: *See*—
Leech, Edward J.; and Russo, Frank D., 4,510,276, Cl. 523-427.000.

Kominami, Yasuo: *See*—
Sato, Tetsuo; Kominami, Yasuo; Takizawa, Yoshiyuki; and Haeno, Akira, 4,510,458, Cl. 330-260.000.

Komiyama, Kunihiko: *See*—
Itow, Koichiro; and Komiyama, Kunihiko, 4,509,953, Cl. 44-57.000.

Kommanditbolaget Aldolf: *See*—
Adolfsson, Bengt O., 4,509,569, Cl. 141-360.000.

Kondo, Haruyoshi: *See*—
Takeuchi, Takashi; Takahashi, Hideaki; Saji, Keiichi; Kondo, Haruyoshi; and Hayakawa, Kiyoharu, 4,510,036, Cl. 204-425.000.

Kondo, Isao: *See*—
Kuriyama, Katsumi; Kondo, Isao; and Misaizu, Iwao, 4,510,186, Cl. 427-381.000.

Konishiroku Photo Industry Co., Ltd.: *See*—
Aoki, Naoki, 4,509,738, Cl. 271-160.000.
Matsuzaka, Syoji; Kajiwara, Makoto; Miyoshi, Masanobu; and Yamashita, Kiyoshi, 4,510,234, Cl. 430-557.000.
Shiozawa, Takao, 4,509,737, Cl. 271-125.000.
Yamazaki, Toshinori; Nomori, Hiroyuki; Matsuzaki, Masatoshi; Shima, Tetsuo; and Myokan, Isao, 4,510,224, Cl. 430-57.000.

Konle, Robert L., to Arthur Smith Industries, Inc. Door gasket. 4,509,292, Cl. 49-499.000.

Koon, Randy G.: *See*—
Barrett, Michael E.; Koon, Randy G.; and Laughon, Thomas C., 4,510,404, Cl. 310-50.000.

Kopp, Richard; and Freitag, Hans-Albrecht, to Bayer Aktiengesellschaft. Process for the production of optionally cellular polyurethanes. 4,510,269, Cl. 521-166.000.

Koppe, Robert G. Pouch forming and filling apparatus. 4,509,313, Cl. 53-570.000.

Korsgen, Hans H.; and Weller, Wolfgang, to Coathylene S.A. Process for the production of polypropylene powders. 4,510,305, Cl. 528-494.000.

Koschnick, Gary A.: *See*—
Cooper, Merton G.; Kerns, William R.; Filley, Daniel E.; and Koschnick, Gary A., 4,509,549, Cl. 137-327.000.

Kosner, Jerry J., to Bell & Howell Company. Variable width envelope feeder. 4,509,735, Cl. 271-11.000.

Kotobuki & Co.: *See*—
Hori, Jiro, 4,509,876, Cl. 401-217.000.

Koumura, Takashi: *See*—
Hasegawa, Shumpei; Otobe, Yutaka; Kishi, Noriyuki; and Koumura, Takashi, 4,509,489, Cl. 123-489.000.

Kowa Shoji, Ltd.: *See*—
Kuroda, Takeshi, 4,509,408, Cl. 92-2.000.

Kozponti Valto: *See*—
Zimber, Bela; and Molnar, Imre, 4,509,330, Cl. 60-537.000.

Krajcsovics, Ferenc: *See*—
Boday, Otto ; Herpay, Andras; Krajcsovics, Ferenc; Neveri, Istvan; Pete, Sandor; Pocsy, Ferenc; Szikora, Bela; and Szirmai, Endre, 4,509,434, Cl. 110-238.000.

Kramann, Bernhard; and Rust, Meinhard, to Sterimed Gesellschaft fur medizinischen Bedarf mbH. Catheter for catheterizing central veins. 4,509,945, Cl. 604-164.000.

Kramer, Wolfgang: *See*—
Pflugbeil, Wolf-Dietrich; and Kramer, Wolfgang, 4,510,314, Cl. 548-262.000.

Krappel, Alfred: *See*—
Minner, Willy; Krappel, Alfred; and Guggenmos, Johannes, 4,509,482, Cl. 123-418.000.

Krause, Hans-Peter: *See*—
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, 4,510,156, Cl. 514-415.000.

Krauss-Maffei Aktiengesellschaft: *See*—
Bauer, Adolf, 4,510,120, Cl. 422-133.000.
Schwarzler, Peter, 4,510,421, Cl. 318-135.000.

Kremser, Harald H.: *See*—
Barth, Walter; and Kremser, Harald H., 4,509,245, Cl. 29-525.000.

Kreuder, Hans-Joachim: *See*—
Meyer, Rolf-Volker; Kreuder, Hans-Joachim; and Hohl, Erwin, 4,510,288, Cl. 525-111.000.

Kriegner, Othmar, to Voest-Alpine Aktiengesellschaft. Method of and arrangement for, recovering the sensible heat of a continuously cast strand. 4,509,582, Cl. 164-486.000.

Kristofek, Paul J., to McGraw-Edison Company. Lamp and filter mounting assembly. 4,510,559, Cl. 362-269.000.

Krohn, Hellmut: *See*—
Solleder, Friedrich; Krohn, Hellmut; Burckhardt, Manfred; and Brugger, Franz, 4,509,802, Cl. 303-110.000.

Krowl, William G., to Chrysler Corporation. Urethane dies. 4,509,358, Cl. 72-476.000.

Kruka, Vitold R.; Kipp, Robert M.; and Cadena, Edward R., to Shell Oil Company. Hydrophone cable decoupler. 4,510,588, Cl. 367-165.000.

Kubach, Hans, to Robert Bosch GmbH. Pressure control valve. 4,509,715, Cl. 251-138.000.

Kubiatowicz, David O.: *See*—
Windorski, David C.; and Kubiatowicz, David O., 4,509,506, Cl. 128-1.200.

Kubo, Yoichiro; Kohtaki, Takaaki; and Oura, Kiyomori, to Nippon Zenn Co. Ltd. Process for hydrogenating conjugated diene polymers. 4,510,293, Cl. 525-338.000.

Kubota, Hitoshi, to Nissan Motor Co., Ltd. Brake pressure control valve of a double piping system. 4,509,800, Cl. 303-6.00C.

Kubota Ltd.: *See*—
Bando, Niro; Kurohara, Kazuaki; Fujima, Yasuo; Ikeda, Fumihiro; Usiro, Kenzo; and Ogasawara, Hiroyuki, 4,509,614, Cl. 180-273.000.

Kudo, Katsutaka: *See*—
Mori, Chuzo; Watanabe, Jun; and Kudo, Katsutaka, 4,509,397, Cl. 83-453.000.

Kuehler, Christopher W., to Chevron Research Company. Coal liquefaction using vacuum distillation and an external residuum feed. 4,510,038, Cl. 208-10.000.

Kuehnle, Manfred R.; Martinez, Ferdinand; Runyan, I. V.; and Barry, Carol M. F., to Coulter Systems Corporation. Multicolor electrophotographic imaging process. 4,510,223, Cl. 430-44.000.

Kuehnle, Manfred R.; and Martinez, Ferdinand, to Coulter Systems Corporation. Electrophotographic method for producing an opaque print. 4,510,225, Cl. 430-126.000.

Kuhn, Falk, to Roser, Erich. Oil lubrication system, especially for knitting machines. 4,509,618, Cl. 184-6.400.

Kulick, John M. Watch crystal cover and package assembly. 4,509,644, Cl. 206-461.000.

Kuljis, Zoran; and Lareau, John P., to Combustion Engineering, Inc. Near surface inspection system. 4,509,369, Cl. 73-628.000.

Kull, Hermann; Wessel, Wolf; and Stumpp, Gerhard, to Robert Bosch GmbH. Safety arrangement for an internal combustion engine. 4,509,480, Cl. 123-359.000.

Kumar, Ananda H.; and Schwartz, Bernard, to International Business Machines Corporation. Method for palladium activating molybdenum metallized features on a ceramic substrate. 4,510,000, Cl. 156-89.000.

Kump, Donald H.: *See*—
Walz, George A.; and Kump, Donald H., 4,510,583, Cl. 364-900.000.

Kunita, Masao: *See*—
Kurihara, Toshio; Kunita, Masao; Yasunaga, Makoto; Masuda, Katuya; Moriya, Takashi; and Oosawa, Seiichi, 4,509,421, Cl. 101-93.040.
Kuo, Chuan-Ming. Cutting torch. 4,509,689, Cl. 239-407.000.
Kuo, Han C.: *See*—
Gopikanth, Mysore L.; Kuo, Han C.; and Schlaikjer, Carl R., 4,510,220, Cl. 429-225.000.
Kuperman, Gilbert G.; and Bodine, Fred R., to United States of America, Air Force. Stereoscopic video imagery generation. 4,510,525, Cl. 358-88.000.
Kuramochi, Kojiro: *See*—
Sumiya, Koji; and Kuramochi, Kojiro, 4,509,391, Cl. 74-869.000.
Kuraray Company, Ltd.: *See*—
Matsubara, Yoshiharu; Hirashima, Tsuneaki; and Nishiguchi, Ikuzo, 4,510,025, Cl. 204-78.000.
Matsumoto, Mitsuo; Yoshimura, Noriaki; and Tamura, Masuhiko, 4,510,332, Cl. 568-454.000.
Yoshimura, Noriaki; and Tamura, Masuhiko, 4,510,331, Cl. 568-450.000.
Kurata, Masami; Inui, Toshiharu; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Two-color copying machine. 4,510,523, Cl. 358-75.000.
Kurata, Masami, to Fuji Xerox Co., Ltd. Color picture reading system. 4,510,524, Cl. 358-80.000.
Kurfman, Virgil B., to Dow Chemical Company, The. Duplex metal alloy/polymer compositions. 4,510,208, Cl. 428-624.000.
Kurihara, Toshio; Kunita, Masao; Yasunaga, Makoto; Masuda, Katuya; Moriya, Takashi; and Oosawa, Seiichi, to Citizen Watch Company Limited. Printer head for a dot line printer. 4,509,421, Cl. 101-93.040.
Kuriyama, Katsumi; Kondo, Isao; and Misaizu, Iwao, to Dainichi Seika Color & Chemicals Mfg. Co., Ltd.; and Ukima Colour & Chemicals Mfg. Co., Ltd. Process for preparing a porous sheet material. 4,510,186, Cl. 427-381.000.
Kuroda, Takeshi, to Kowa Shoji, Ltd. Fluid pressure actuator. 4,509,408, Cl. 92-2.000.
Kurohara, Kazuaki: *See*—
Bando, Niro; Kurohara, Kazuaki; Fujima, Yasuo; Ikeda, Fumihiro; Usiro, Kenzo; and Ogasawara, Hiroyuki, 4,509,614, Cl. 180-273.000.
Kurokawa, Koji, to Tokyo Shibaura Denki Kabushiki Kaisha. Apparatus for stacking letter mail. 4,509,739, Cl. 271-176.000.
Kurokawa, Zenkichi: *See*—
Nashimoto, Junichi; and Kurokawa, Zenkichi, 4,509,893, Cl. 414-280.000.
Kust, Cyril; and Bhalla, Prithvi, to American Cyanamid Company. Plant growth regulating compositions. 4,509,973, Cl. 71-92.000.
Kusuda, Mikio: *See*—
Ohshima, Shohzo; Kusuda, Mikio; and Isoya, Toshiro, 4,510,034, Cl. 204-290.00F.
Kuwazuru, Yasumitsu: *See*—
Takenaka, Akira; Shimasaki, Keiichi; and Kuwazuru, Yasumitsu, 4,509,803, Cl. 308-5.00R.
Kuzumoto, Masaki: *See*—
Yagi, Shigenori; Kuzumoto, Masaki; Tanaka, Masaaki; and Ogawa, Shuji, 4,510,606, Cl. 372-25.000.
Kvaternik, Joseph. Miniature circuit processing devices and matrix test heads for use therein. 4,510,445, Cl. 324-158.00F.
La Calhene Societe Anonyme: *See*—
Mercey, Gilles; Picard, Claude; and Saint-Martin, Bernard, 4,509,505, Cl. 128-1.00B.
Labavia S.G.E.: *See*—
Marandet, Andre , 4,509,623, Cl. 192-4.00A.
Lacrex Brevetti S.A.: *See*—
Pasbrig, Max, 4,509,469, Cl. 123-154.000.
Ladouceur, Lawrence C., to Rockwell International Corporation. Manufacturing apparatus for laminate structure. 4,509,256, Cl. 29-802.000.
Laforest Le Boudec, Guy, to Laforest, S.A. Devices for producing ignition sparks when falling on a pyrophoric flint. 4,509,916, Cl. 431-273.000.
Laforest, S.A.: *See*—
Laforest Le Boudec, Guy, 4,509,916, Cl. 431-273.000.
Lagow, Richard J.; and Persico, Daniel F. Perfluorinated branched ether compounds. 4,510,335, Cl. 568-683.000.
Laitram Corporation, The: *See*—
Lapeyre, James M., 4,509,617, Cl. 182-93.000.
LaMattina, John L.; and Lipinski, Christopher A., to Pfizer Inc. 2-Guanidino-4-heteroarylthiazoles. 4,510,313, Cl. 548-194.000.
Lambert, Clifford L., Jr.; and Duranleau, Roger G., to Texaco Inc. Process for the preparation of formylalkanolamines. 4,510,326, Cl. 564-132.000.
Lambert, Gerard L.; and Saffer, Gary M., to Mattel, Inc. Powered toy vehicle with pivotable axle mounting. 4,509,931, Cl. 446-462.000.
Lamirande, Donald J.: *See*—
Griffin, Michael D.; Gural, John A.; and Lamirande, Donald J., 4,509,720, Cl. 251-308.000.
Lamontagne, Claude: *See*—
Resneau, Jean C.; Puyhaubert, Jean; Da Silva, Evelyne; and Lamontagne, Claude, 4,510,470, Cl. 333-142.000.
Lamy, Jean-Michel; and Boutant, Jean-Jacques, to Regie Nationale des Usines Renault. Manual gearbox ratio change control device. 4,509,384, Cl. 74-473.00R.
Landis, Phillip S.: *See*—
Braid, Milton; and Landis, Phillip S., 4,509,956, Cl. 44-68.000.
Landsberger, Kurt. Inflatable implement handle. 4,509,228, Cl. 16-114.00R.
Lane, Michael S.: *See*—
Costello, Peter E.; Fossett, Lawrence D.; Lane, Michael S.; Quin, Terrence T.; and Smith, Nicholas K., 4,510,351, Cl. 179-27.00D.
Langdon, William K., to BASF Wyandotte Corporation. Method for purifying reaction products containing higher-alkyl glycosides. 4,510,306, Cl. 536-127.000.
Langen, Marinus J. M.; and Guttinger, Peter, to H. J. Langen & Sons Limited. Load orienting receptacles for carton loading machines. 4,509,309, Cl. 53-142.000.
Langen, Marinus J. M.; Strauss, Edgars H., deceased; and by Strauss, Leida, administrator. Handle for carrier bag and method of making handled carrier bag. 4,510,620, Cl. 383-14.000.
Langenegger, Henrique: *See*—
Breitman, Daniel S.; and Langenegger, Henrique, 4,509,962, Cl. 55-306.000.
Lanier Business Products, Inc.: *See*—
Young, Jeffrey E., 4,510,539, Cl. 360-92.000.
Lapeyre, James M., to Laitram Corporation, The. Stair having alternate half treads. 4,509,617, Cl. 182-93.000.
L'Archer, Germain. Woodworking press. 4,509,572, Cl. 144-84.000.
Lareau, John P.: *See*—
Kuljis, Zoran; and Lareau, John P., 4,509,369, Cl. 73-628.000.
Larsen, Donald R. Water sprinkling apparatus. 4,509,686, Cl. 239-239.000.
Larson, David B.: *See*—
Earl, Robert B.; Larson, David B.; and Nguyen, Huy X., 4,509,598, Cl. 166-308.000.
Larson, Michael J.: *See*—
Sanders, Albert J., Jr.; and Larson, Michael J., 4,509,981, Cl. 106-3.000.
Lasar Manufacturing Co.: *See*—
Lasar, William, III, 4,509,860, Cl. 366-99.000.
Lasar, William, III, to Lasar Manufacturing Co. Dual action mixer. 4,509,860, Cl. 366-99.000.
Laskowski, Gordon J., to United States of America, Navy. Bridge crane hoist stop system. 4,509,431, Cl. 104-250.000.
Lasley, Robert A. Portable and collapsible hyperbaric chamber assembly. 4,509,513, Cl. 128-202.120.
Lassally, Gunter M., to Amstelstaal B.V. Operating mechanism for a high-pressure valve having a valve passage of relatively small width. 4,509,721, Cl. 251-335.00B.
Last, Anthony J. Surface vibration absorbing strap. 4,509,750, Cl. 273-29.00A.
Lather, Dieter: *See*—
Fischer, Gert; and Lather, Dieter, 4,509,815, Cl. 339-147.00P.
Latsch, Reinhard: *See*—
Breuser, Erich; Grozinger, Wilhelm; Latsch, Reinhard; and Wurfel, Gernot, 4,509,476, Cl. 123-266.000.
Lattin, Gary A., to Medtronic, Inc. Self-cleaning drug delivery catheter and storage bladder. 4,509,947, Cl. 604-266.000.
Lauf, Robert J., to United States of America, Energy. Process for fabricating ZnO-based varistors. 4,510,112, Cl. 264-234.000.
Laughon, Thomas C.: *See*—
Barrett, Michael E.; Koon, Randy G.; and Laughon, Thomas C., 4,510,404, Cl. 310-50.000.
Laurel Bank Machine Co., Ltd.: *See*—
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.
Watanabe, Kenkichi; and Furuya, Katusuke, 4,509,542, Cl. 133-8.00A.
Lautenschlager, Karl, Jr., to Karl Lautenschlager KG Mobelbeschlagfabrik. Joint fastener for the assembly of moldings. 4,509,882, Cl. 403-402.000.
Laval, Michel: *See*—
Allemand, Robert; and Laval, Michel, 4,510,394, Cl. 250-483.100.
Lavochkin, Ronald B., to IMC Magnetics Corp. Heat dissipator for semiconductor devices. 4,509,839, Cl. 357-81.000.
Lavoie, Gerald H.: *See*—
Caslavsky, Jaroslav L.; Lavoie, Gerald H.; Earle, William H.; and Viechnicki, Dennis J., 4,510,609, Cl. 373-110.000.
LaVoie, Marvin E.: *See*—
McClanahan, John B.; LaVoie, Marvin E.; Kelsoe, Wayne E.; and Wrobel, James, 4,510,482, Cl. 338-24.000.
Lawrence Medical Systems, Inc.: *See*—
Barnes, Stephen R.; Tarbox, Gary L.; Huntsman, Lee L.; and McLaren, Barry D., 4,509,526, Cl. 128-663.000.
Lawson, A. David. Personalized laminated display. 4,510,006, Cl. 156-235.000.
La Zare, Howard T. Multi format shutterless motion picture inspection projector. 4,509,836, Cl. 352-200.000.
Lazzari, Jean-Pierre, to Compagnie Internationale pour l'Informatique CII-Honeywell Bull. Optoelectronic device for reading data contained on a magnetic medium. 4,510,544, Cl. 360-114.000.
Lea Manufacturing Company, The: *See*—
McGowan, William M., 4,510,018, Cl. 156-666.000.
LeBrun, Thomas Q.; Torkelson, John; Dempster, Roy E.; and Van Tyne, Richard G., to BancTec, Incorporated. Document processing system. 4,510,619, Cl. 382-57.000.
Lechelt, Wayne M.: *See*—
Boyce, William C.; Wittekind, Warren D.; Howard, Leroy C.; Hall, Thomas E.; and Lechelt, Wayne M., 4,510,573, Cl. 364-498.000.
Lechtken, Peter; Nuerrenbach, Axel; and Schole, Juergen, to BASF Aktiengesellschaft. Growth-promoting feed and drink. 4,510,146, Cl. 514-312.000.

LeClercq, Marion J. Support undergarment for penile prothesis implant patient. 4,509,512, Cl. 128-160.000.
Lectron Products, Inc.: *See*—
Michaels, Paul A.; and Kaleita, David L., 4,510,426, Cl. 318-565.000.
Ledvina, Timothy J.; and Mead, Robert H., to Borg-Warner Corporation. Power transmission chain. 4,509,323, Cl. 59-8.000.
Ledvina, Timothy J.; and Mead, Robert H., to Borg-Warner Corporation. Power transmission chain. 4,509,937, Cl. 474-213.000.
Lee, Kang I.; and Jopson, Harriet, to GTE Laboratories, Inc. Electrically conductive blends of an acetylene polymer and an elastomer having low unsaturation. 4,510,075, Cl. 252-500.000.
Lee, Kang I.; and Jopson, Harriet, to GTE Laboratories, Inc. Electrically conductive polymer blends of an acetylene polymer and a triblock thermoplastic elastomer. 4,510,076, Cl. 252-500.000.
Lee, Lester H.; Johnson, Kathryn M.; and Jones, Richard W., to General Electric Company. Method for fabricating a steam turbine diaphragm. 4,509,238, Cl. 29-156.80R.
Lee, Man S.: *See*—
Chang, Chieh; and Lee, Man S., 4,510,466, Cl. 332-31.00R.
Chang, Chieh; and Lee, Man S., 4,510,467, Cl. 332-31.00R.
Lee, Norman E., to United States of America, Energy. Rotor for centrifugal fast analyzers. 4,509,856, Cl. 356-246.000.
Lee, Robert G. H.: *See*—
Savard, Guy; and Lee, Robert G. H., 4,509,595, Cl. 166-261.000.
Lee, Shung-Yan L.: *See*—
Coveleskie, Richard A.; and Lee, Shung-Yan L., 4,510,230, Cl. 430-273.000.
Lee, Shy-Fuh, to Zoecon Corporation. Substituted phenylphosphinyloxy- and phosphinylthio-iminocarboxylates useful for the control of weeds. 4,509,970, Cl. 71-86.000.
Lee, Thomas D., to USV Pharmaceutical Corporation. Pyridinylimidazole pharmaceutical composition. 4,510,151, Cl. 514-341.000.
Leech, Edward J.; and Russo, Frank D., to Kollmorgen Technologies Corporation. Epoxy resin coating compositions for printed circuit boards. 4,510,276, Cl. 523-427.000.
Leesona Corporation: *See*—
Arends, Albert W., 4,509,909, Cl. 425-388.000.
Legoult, Michel, to Etablissements-Pierre Fontaine. Processes and devices for providing a load with an electric AC supply without discontinuity of the AC signal. 4,510,401, Cl. 307-66.000.
Leitz, Helmut, to Carl-Zeiss-Stiftung. Target for measurements with angle-measuring instruments. 4,509,269, Cl. 33-293.000.
Leland Stanford Jr. University, The Board of Trustees of the: *See*—
Parks, David R.; Bryan, Virginia M.; and Herzenberg, Leonard A., 4,510,244, Cl. 435-172.200.
Lemmeke, Leif. Method for combined utilization of heat-conveying media such as ground water or surface water or the like as a heat source. 4,509,680, Cl. 237-2.00B.
Lemoine, Claude: *See*—
Grall, Georges; Joseph, Jacques; and Lemoine, Claude, 4,510,586, Cl. 367-87.000.
Lenchin, Julianne M.; Trubiano, Paolo C.; and Hoffman, Stella, to National Starch and Chemical Corporation. Converted starches for use as a fat- or oil-replacement in foodstuffs. 4,510,166, Cl. 426-565.000.
Leslie, Elmer N.: *See*—
Martell, Charles R.; Leslie, Elmer N.; and Treadwell, Stephen S., 4,509,443, Cl. 112-262.100.
Lesz, Jan: *See*—
Holzapfel, Georg; and Lesz, Jan, 4,510,174, Cl. 427-65.000.
Letsche, Ulrich: *See*—
Forster, Hans-Joachim; Lubbing, Bernd-Eric; and Letsche, Ulrich, 4,509,488, Cl. 123-481.000.
Leuschner, Horst: *See*—
Dias, Donald R.; Guterman, Daniel C.; Proebsting, Robert J.; and Leuschner, Horst, 4,510,584, Cl. 365-203.000.
Lever Brothers Company: *See*—
Schmidt, Werner J.; Dijkshoorn, Willem; Stratmann, Wilhelm; and Vermaas, Leo F., 4,510,167, Cl. 426-607.000.
Levick, Lois B. Pita bread sandwich holder. 4,509,674, Cl. 229-23.00R.
Levy, Stanley B., to Du Pont de Nemours, E. I., and Company. Perfluorocarbon copolymer films. 4,510,300, Cl. 526-247.000.
Levy, Stanley B., to Du Pont de Nemours, E. I., and Company. Fluorocarbon copolymer films. 4,510,301, Cl. 526-254.000.
Lewis, Conrad, to Mitel Corporation. Time division switching matrix. 4,510,397, Cl. 370-66.000.
Lewis, Robert M.; Ott, Kevin C.; and Van Santen, Rutger A., to Shell Oil Company. Silica-clay complexes. 4,510,257, Cl. 502-63.000.
Leybold Heraeus GmbH: *See*—
Reimpell, Uwe; and Stenzel, Otto, 4,509,807, Cl. 339-9.00R.
Liang, Po-Lung: *See*—
Vahratian, Adam; Maynard, Roosevelt, Jr.; Croswhite, Howard L.; and Liang, Po-Lung, 4,509,389, Cl. 74-695.000.
Libman Broom Company: *See*—
Batchelor, Douglas R., 4,509,224, Cl. 15-244.00R.
Licentia Patent-Verwaltungs-GmbH: *See*—
Gockler, Heinz; and Scheuermann, Helmut, 4,510,598, Cl. 370-50.000.
Lie, Hakon, to Chatanooga Corporation. Balance training apparatus. 4,509,743, Cl. 272-97.000.
Liedel, Thomas H.: *See*—
Woodhull, Ivan D., Jr.; and Liedel, Thomas H., 4,509,672, Cl. 228-175.000.
Liggett, John V., to Rockwell International Corporation. Method of forming a wheel. 4,509,239, Cl. 29-159.00A.
Lillie, Dana J.: *See*—
Marquam, Barbara J.; and Lillie, Dana J., 4,509,268, Cl. 33-201.000.
Lily Corporation: *See*—
Trout, John F.; and Hoffman, John J., 4,509,884, Cl. 405-269.000.
Lincoln Laser Company: *See*—
Sherman, Randy J.; and Hanson, Derald F., 4,509,819, Cl. 350-6.700.
Linden, Gerbert: *See*—
Mengel, Rudolf; Schroder, Ludwig; Stransky, Werner; Linden, Gerbert; Schneider, Gerhart; and Lust, Sigmund, 4,509,972, Cl. 71-92.000.
Lindgren, Erik V. Ski sharpener. 4,509,297, Cl. 51-181.00R.
Lindsay, Harold W. Cutting tool with cutting inserts having positioning keyways. 4,509,886, Cl. 407-102.000.
Lindsey, Roland G.; and Simms, John A., to Du Pont de Nemours, E. I., and Company. Process for making isocyanate-functional polymers containing low residual monomeric isocyanate. 4,510,298, Cl. 526-87.000.
Link, Christoph: *See*—
Volz, Karl; Link, Christoph; Stotz, Wolf-Gunter; and Heitmann, Peter, 4,509,237, Cl. 29-116.0AD.
Linnau, Yendra: *See*—
Eibl, Johann; Hetzl, Ernst; and Linnau, Yendra, 4,510,084, Cl. 260-112.00B.
Linner, John G., to Board of Regents, The University of Texas, The. Method and apparatus for cryopreparing biological tissue for ultrastructural analysis. 4,510,169, Cl. 427-4.000.
Linsker, Eugene, to Tech Development Inc. Turbine rotor. 4,509,896, Cl. 415-9.000.
Lion Corporation: *See*—
Hara, Noboru; Fukudome, Shinichi; Johna, Nobuo; and Nakamura, Masayoshi, 4,510,073, Cl. 252-383.000.
Lipinski, Christopher A.: *See*—
LaMattina, John L.; and Lipinski, Christopher A., 4,510,313, Cl. 548-194.000.
Lipscomb, Robert J., to Precision Steel Warehouse, Inc. Method and apparatus for supplying metal coils to a processing station. 4,509,891, Cl. 414-113.000.
Litt, Gerald J.; and Litt, Lloyd C., to Du Pont de Nemours, E. I., and Company. Autoradiogram marking process. 4,510,392, Cl. 250-475.200.
Litt, Lloyd C.: *See*—
Litt, Gerald J.; and Litt, Lloyd C., 4,510,392, Cl. 250-475.200.
Little, Roger G.: *See*—
Spitzer, Mark B.; and Little, Roger G., 4,509,248, Cl. 29-572.000.
Litvinenko, Leonid A.: *See*—
Redikultsev, Jury V.; and Litvinenko, Leonid A., 4,510,249, Cl. 435-289.000.
Litz, Milton B., to Power Piping Company. Insulation device for application to an uninsulated portion of a preinsulated pipe. 4,509,561, Cl. 138-149.000.
Liu, Chao-Min; and Westley, John, to Hoffmann-La Roche Inc. Antibiotic X-14934A. 4,510,317, Cl. 549-343.000.
Liu, Chia-Seng, to Hercules Incorporated. Bonding resin composition. 4,510,286, Cl. 525-71.000.
Liu, Mau-Fan. Model shuttlecock. 4,509,761, Cl. 273-417.000.
Livingston, James W.; and Schontzler, James G., to Beta Technology, Inc. Industrial dishwasher monitor/controller with speech capability. 4,509,543, Cl. 134-57.00D.
Lloyd, Charles F.: *See*—
Barber, Michael; and Lloyd, Charles F., 4,509,716, Cl. 251-141.000.
Lobach, Ernst W.: *See*—
Tabarelli, Werner; and Lobach, Ernst W., 4,509,852, Cl. 355-30.000.
Locati, Ronald P.; and Rickrode, James A., to AMP Incorporated. Connector centering device and method for using. 4,509,258, Cl. 29-876.000.
Lockheed Corporation: *See*—
McInturff, Joe A.; and Patterson, David W., 4,509,367, Cl. 73-457.000.
Longini, Richard L. Energy use monitoring system. 4,509,679, Cl. 236-94.000.
Longmire, Jerry L.; Thuot, Michael E.; and Warren, David S., to United States of America, Energy. Prefire identification for pulse power systems. 4,510,451, Cl. 328-130.100.
Lorenz, Werner; Bathke, Heinz; and Sommers, Hans, to Gaswarme-Institut e.V.; and Ruhrgas AG. Device for controlling the air supply for a gas burner. 4,509,913, Cl. 431-90.000.
Loschen, Gerriet K. H.: *See*—
Boehlke, Horst R. E.; Loschen, Gerriet K. H.; Michel, Gudrun E.; and Muller, Bernd, 4,510,323, Cl. 514-530.000.
Loszewski, Raymond C., to Avco Corporation. Bis-maleimide-epoxy compositions and prepregs. 4,510,272, Cl. 523-400.000.
Lotter, Karl. Plug connector for dil components. 4,509,812, Cl. 339-75.00M.
Lougheed, Robert M.; and Mudge, Trevor N., to Environmental Research Institute of Michigan, The. Design rule checking using serial neighborhood processors. 4,510,616, Cl. 382-8.000.
Lubbing, Bernd-Eric: *See*—
Forster, Hans-Joachim; Lubbing, Bernd-Eric; and Letsche, Ulrich, 4,509,488, Cl. 123-481.000.
Lubrizol Corporation, The: *See*—
Hayashi, Katsumi, 4,509,955, Cl. 44-62.000.
Lucas Industries Public Limited Company: *See*—
Mowbray, Dorian F., 4,509,487, Cl. 123-458.000.
Skinner, Robert T. J., 4,509,691, Cl. 239-533.900.

Ludecke, Otto A.: *See*—
Dimick, David L.; Bly, Kenneth B.; and Ludecke, Otto A., 4,509,966, Cl. 55-502.000.

Ludwigsen, Jill L.: *See*—
Ludwigsen, John S.; Ludwigsen, Jill L.; and Gallagher, Terry A., 4,509,344, Cl. 62-76.000.

Ludwigsen, John S.; Ludwigsen, Jill L.; and Gallagher, Terry A., to Chicago Bridge & Iron Company. Apparatus and method of cooling using stored ice slurry. 4,509,344, Cl. 62-76.000.

Lummus Company, The: *See*—
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,510,258, Cl. 502-209.000.

Lundell, Dennis A.: *See*—
Houck, Richard C.; and Lundell, Dennis A., 4,509,244, Cl. 29-516.000.

Lunz, Alfred-Gunther: *See*—
Oellig, Oskar; Grimmer, Horst; and Lunz, Alfred-Gunther, 4,509,864, Cl. 368-108.000.

Luper, Charles R., to Sensormedics Corporation. Breath switch. 4,509,551, Cl. 137-554.000.

Lupke, Gerd P. H.: *See*—
Lupke, Manfred A. A.; and Lupke, Gerd P. H., 4,510,013, Cl. 156-498.000.

Lupke, Manfred A. A.; and Lupke, Gerd P. H. Apparatus for producing multi-walled thermoplastic tubing. 4,510,013, Cl. 156-498.000.

Lust, Sigmund: *See*—
Mengel, Rudolf; Schroder, Ludwig; Stransky, Werner; Linden, Gerbert; Schneider, Gerhart; and Lust, Sigmund, 4,509,972, Cl. 71-92.000.

Luttenberger, Alfred: *See*—
Heimel, Helmut; Schlosser, Willy; and Luttenberger, Alfred, 4,509,274, Cl. 34-114.000.

Lynch, Michael W.; and Pullukat, Thomas J., to Chemplex Company. Polymerization method. 4,510,299, Cl. 526-129.000.

Lyons, Robert V. Device for testing game balls. 4,509,362, Cl. 73-79.000.

M.A.N. Maschinenfabrik Ausburg-Nurnberg Aktiengesellschaft: *See*—
Vollhardt, Frohmut; and Haacker, Heinz, 4,509,463, Cl. 122-7.00R.

M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Pflaum, August; and Mayer, Albert, 4,509,733, Cl. 270-41.000.

Maag Gear-Wheel & Machine Company Limited: *See*—
Schneider, Otto, 4,510,587, Cl. 367-118.000.

MacArthur, J. Ward; and Radomski, James V., to Honeywell Inc. Specific coefficient of performance measuring device. 4,510,576, Cl. 364-551.000.

MacAskill, Christopher R.; and Potter, Jared M., to Petrophysical Services, Inc. Metering pump. 4,509,904, Cl. 417-568.000.

MacGregor, John R.; Rupert, Gary F.; and Kennedy, Thomas M., to Raycon Corporation. Electronic depth controller for EDM apparatus. 4,510,365, Cl. 219-69.00G.

Mack, Audrey: *See*—
Howe, Clarice M.; and Mack, Audrey, 4,509,444, Cl. 112-262.100.

Mack's Guns: *See*—
McMillon, Carlos H., 4,509,282, Cl. 42-1.0ST.

MacLaurin, Andrew: *See*—
Money, David K.; Swift, Stephen; MacLaurin, Andrew; and Frost, John G., 4,509,529, Cl. 128-708.000.

Macrander, Max S.: *See*—
Edwards, Ivan L.; McLaughlin, Robert C.; and Macrander, Max S., 4,510,462, Cl. 331-1.00A.

Macura, Slobodan: *See*—
Ernst, Richard R.; Wuthrich, Kurt; and Macura, Slobodan, 4,510,449, Cl. 324-309.000.

Maeba, Yukio, to Murata Manufacturing Co., Ltd. Stabilizing power-supply circuit. 4,510,562, Cl. 363-19.000.

Maeda, Masaya, to Canon Kabushiki Kaisha. Still-mode magnetic reproducing device. 4,510,534, Cl. 360-10.300.

Maeda, Senichi. Elastic covered yarn and method and apparatus for producing the same. 4,509,320, Cl. 57-225.000.

Maekawa, Yukio: *See*—
Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, 4,510,233, Cl. 430-527.000.

Magnetic Information Technology, Inc.: *See*—
Gyi, Ko K.; and Grewal, Gurbachan S., 4,509,251, Cl. 29-603.000.

Magnuson Corporation: *See*—
Chiu, Tony T.; Coatney, Charles W.; and Hirahara, Katsuji, 4,509,414, Cl. 99-585.000.

Maguire, Daniel J. Tamperproof closure. 4,509,654, Cl. 215-253.000.

Mahan, Douglas P. Horizontal axis tumbler type microwave drying mechanism. 4,510,361, Cl. 219-10.55A.

Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased (by Trainor, Marie L., executrix), to Owens-Corning Fiberglas Corporation. Process for improving probertite concentration in probertite containing ore. 4,510,048, Cl. 209-3.000.

Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased (by Trainor, Marie L., executor), to Owens-Corning Fiberglas Corporation. Process for recovery of colemanite and probertite from mixed low grade ore. 4,510,049, Cl. 209-3.000.

Maida, Osamu; Takemae, Mikio; and Okubo, Yuji, to Nippon Kogaku K.K. Automatic exposure control camera having a low brightness warning device. 4,509,847, Cl. 354-442.000.

Mains, Gilbert L., Jr. Tube bundle cleaning apparatus. 4,509,544, Cl. 134-144.000.

Makilaakso, Antero, to Printal Oy. Tube end piece. 4,509,660, Cl. 222-107.000.

Makowski, Lawrence A.: *See*—
Drotar, Frederick L.; Wotton, David R.; Dickerson, Carroll D.; and Makowski, Lawrence A., 4,509,772, Cl. 280-661.000.

Malacria, Max: *See*—
Bluthe, Norbert; Gore, Jacques; and Malacria, Max, 4,510,330, Cl. 568-403.000.

Mallinckrodt, Inc.: *See*—
Grogg, Terry W.; Bugaj, Joseph E.; and Bates, Paul E., 4,510,125, Cl. 424-1.100.
Mills, Donald F., 4,510,241, Cl. 435-23.000.

Malm, John A. Liquid metal switch apparatus. 4,510,356, Cl. 200-48.00R.

Malott, Roger J.: *See*—
Jovick, Raymond J.; Malott, Roger J.; and Evans, Thomas E., 4,510,408, Cl. 310-168.000.

Manahan, Edward H.: *See*—
Masilamani, Divakaran; and Manahan, Edward H., 4,510,321, Cl. 562-421.000.

Manchem Limited: *See*—
Holland, Frank S.; Womersley, Peter; and Curran, John, 4,510,095, Cl. 260-429.700.

Manciocchi, William D., Jr., to Manciocchi, William D., Jr.; Allison, Lawrence S.; Griffin, Robert F., Jr.; and Hall, Steven J. Antiseptic toothpick. 4,509,541, Cl. 132-90.000.

Mannesmann AG: *See*—
Stucke, Walter, 4,510,007, Cl. 156-244.120.

Mannesmann Aktiengesellschaft: *See*—
Fischer, Gert; and Lather, Dieter, 4,509,815, Cl. 339-147.00P.

Mannesmann Veba Umweltttechnik GmbH: *See*—
Riemann, Hanns-Helmut; Sonnenschein, Hans; and Skaletz, Heinz, 4,509,697, Cl. 241-72.000.

Manning, Donald L., to Transpec, Inc. Energy absorbing vehicle bumper. 4,509,782, Cl. 293-121.000.

Manning Technologies, Inc.: *See*—
Brown, Alvin E., 4,509,373, Cl. 73-861.280.

Manuccia, Thomas J.; and Eden, J. Gary, to United States of America, Navy. Infrared optical measurement of blood gas concentrations and fiber optic catheter. 4,509,522, Cl. 128-634.000.

Marandet, Andre , to Labavia S.G.E. Retarder equipment for vehicles. 4,509,623, Cl. 192-4.00A.

Marans, Nelson S.: *See*—
Kehr, Clifton L.; Wszolek, Walter R.; and Marans, Nelson S., 4,510,097, Cl. 260-453.00A.

Marason, Gabriel, Jr.: *See*—
Girton, Virgil M.; Marason, Gabriel, Jr.; and Wang, Lawrence C., 4,510,590, Cl. 369-63.000.

Marathon Oil Company: *See*—
Schroeder, Donald E., Jr., 4,510,397, Cl. 290-43.000.
Sweet, Welby C., 4,509,967, Cl. 62-17.000.

Marchal, Paul: *See*—
Guittet, Jack; Marchal, Paul; Micaelli, Alain; and Vertut, Jean, 4,510,574, Cl. 364-513.000.

Marine Concepts, Inc.: *See*—
Sutton, John R., 4,509,446, Cl. 114-45.000.

Markart, Ernst; Blumel, Reinhard; and Eggert, Holger. Apparatus for optoelectronic evaluation of test strips. 4,509,859, Cl. 356-446.000.

Marketing Displays, Inc.: *See*—
Seely, James R., 4,509,714, Cl. 248-618.000.

Marquam, Barbara J.; and Lillie, Dana J. Dental curet sharpening guide. 4,509,268, Cl. 33-201.000.

Marra, Gerardo J. Tool for quick removal of knock-out plugs. 4,509,242, Cl. 29-267.000.

Mars Inc.: *See*—
Durbye, Hartmut, 4,509,457, Cl. 119-1.000.

Marsteller & Killman GmbH & Co. KG: *See*—
Killmann, Peter A., 4,509,655, Cl. 215-309.000.

Martell, Charles R.; Leslie, Elmer N.; and Treadwell, Stephen S., to Microdynamics, Inc. Automatic sewing machine and method for jacket sleeve attachment. 4,509,443, Cl. 112-262.100.

Martin, Edward T., to Axis Products Limited. Fluid handling device. 4,509,411, Cl. 98-34.500.

Martin, Michael L., to Martin Research & Development. Arm wrestling apparatus. 4,509,747, Cl. 272-136.000.

Martin Research & Development: *See*—
Martin, Michael L., 4,509,747, Cl. 272-136.000.

Martin, Robert G.: *See*—
Reece, John M.; Martin, Robert G.; and Franzel, John R., 4,510,572, Cl. 364-489.000.

Martin, Robert J.; Cisko, Lawrence W.; and Turley, Bernard C., to Aluminum Company of America. Frozen electrolyte bath removal apparatus. 4,510,033, Cl. 204-245.000.

Martinez, Ferdinand: *See*—
Kuehnle, Manfred R.; Martinez, Ferdinand; Runyan, I. V.; and Barry, Carol M. F., 4,510,223, Cl. 430-44.000.
Kuehnle, Manfred R.; and Martinez, Ferdinand, 4,510,225, Cl. 430-126.000.

Maruyama, Teruo; and Yamauchi, Shinya, to Matsushita Electric Industrial Co., Ltd. Compressor with extended area between suction port and suction groove. 4,509,905, Cl. 418-75.000.

Marvel Specialty Company: *See*—
Gregory, Lee W., 4,509,442, Cl. 112-261.000.

Maschinenfabrik Andritz Actiengesellschaft: *See*—
Heimel, Helmut; Schlosser, Willy; and Luttenberger, Alfred, 4,509,274, Cl. 34-114.000.

Maschinenfabrik Augsburg-Nurnberg: *See*—
Cornils, Boy; Tihanyi, Bela; Weber, Jurgen; DeWin, Werner; Erben, Edwin; and Muhlratzer, August, 4,510,182, Cl. 427-162.000.

Maschinenwerk Rau GmbH: *See*—
Rau, Willy; and Taus, Christian, 4,509,438, Cl. 111-13.000.

Mase, Sadaaki: *See*—
Minowa, Nobuto; Fukatsu, Shunzo; Niida, Taro; and Mase, Sadaaki, 4,510,102, Cl. 260-941.000.

Maselli, James M.: *See*—
Kim, Gwan; Pereira, Carmo J.; Hegedus, Louis; and Maselli, James M., 4,510,262, Cl. 502-304.000.
Pereira, Carmo J.; Hegedus, Louis; and Maselli, James M., 4,510,261, Cl. 502-304.000.

Masilamani, Divakaran; and Manahan, Edward H., to Allied Corporation. Autoxidative cleavage of ketones in the presence of pulverized alkali metal hydroxide. 4,510,321, Cl. 562-421.000.

Mask, Ernest D. Articulated exercise bench with leg curl device. 4,509,746, Cl. 272-134.000.

Mason, Preston A. Block guide cutter. 4,509,398, Cl. 83-745.000.

Massachusetts Institute of Technology: *See*—
Erwin, Lewis; and Dohner, Jeffrey L., 4,509,360, Cl. 73-61.00R.

Mast, Aquila D.: *See*—
High, Sam; and Mast, Aquila D., 4,509,862, Cl. 366-158.000.

Mast Immunosystems, Ltd.: *See*—
Sell, William J.; Peisach, Joel M.; and Riege, David H., 4,510,393, Cl. 250-475.200.

Masuda, Katuya: *See*—
Kurihara, Toshio; Kunita, Masao; Yasunaga, Makoto; Masuda, Katuya; Moriya, Takashi; and Oosawa, Seiichi, 4,509,421, Cl. 101-93.040.

Masuda, Senichi; and Sugita, Naoki, to Masuda, Senichi. High-efficiency electrostatic filter device. 4,509,958, Cl. 55-132.000.

Masumoto, Yutaka: *See*—
Ohta, Hiroyuki; and Masumoto, Yutaka, 4,510,543, Cl. 360-106.000.

Masutani, Kenzo: *See*—
Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, 4,509,592, Cl. 165-166.000.

Material Vegyipari Szovetkezet: *See*—
Bar, Vilmos; Boszormenyi, Jozsef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,510,147, Cl. 514-314.000.

Mathiasson, Lennart: *See*—
Gedeon, Andras; and Mathiasson, Lennart, 4,509,359, Cl. 73-23.000.

Matrix Science Corporation: *See*—
Mattingly, William R., Jr., 4,509,814, Cl. 339-93.00R.

Matsubara, Masaki: *See*—
Iba, Youich; Nakahashi, Ken-ichi; and Matsubara, Masaki, 4,509,838, Cl. 354-62.000.

Matsubara, Yoshiharu; Hirashima, Tsuneaki; and Nishiguchi, Ikuzo, to Kuraray Company, Ltd. Method for production of 3-substituted-2,2-dimethylbicyclo[2.2.1]heptan-5-ols and esters thereof. 4,510,025, Cl. 204-78.000.

Matsuda, Akira: *See*—
Oda, Hidekuni; Minami, Syuji; Inoue, Hiroshi; Matsuda, Akira; and Yamamoto, Yohzoh, 4,510,303, Cl. 526-282.000.

Matsuda, Hideaki: *See*—
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, 4,510,270, Cl. 523-176.000.

Matsui, Katsuo: *See*—
Suzuki, Akio; Akiyama, Mitsuo; Uzuhashi, Hideo; Ochiai, Izumi; Yamashita, Hitoshi; Sekine, Youji; Matsui, Katsuo; and Tomita, Syuji, 4,509,354, Cl. 72-294.000.

Matsui, Kazumasa: *See*—
Kagawa, Hiroshi; and Matsui, Kazumasa, 4,510,217, Cl. 429-104.000.

Matsui, Makoto: *See*—
Kato, Yoshinori; Matsui, Makoto; and Nonaka, Zenichiro, 4,509,638, Cl. 198-486.000.

Matsui, Shigetomo: *See*—
Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, 4,509,776, Cl. 285-55.000.

Matsumaru, Hiroshi: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, 4,510,492, Cl. 340-825.050.

Matsumoto, Akio: *See*—
Yokota, Mitsuyoshi; and Matsumoto, Akio, 4,510,425, Cl. 318-484.000.

Matsumoto, Mitsuo; Yoshimura, Noriaki; and Tamura, Masuhiko, to Kuraray Company, Ltd. Process for producing 1,9-nonanedial. 4,510,332, Cl. 568-454.000.

Matsumoto, Tetsuo: *See*—
Hachisu, Takeshi; Taguchi, Keiji; Sasaki, Toshimi; Matsumoto, Tetsuo; and Hidao, Nobuyoshi, 4,509,995, Cl. 148-143.000.

Matsumura, Michio; Inoue, Takao; and Arai, Toshihiro, to Sekisui Kagaku Kogyo Kabushiki Kaisha. Heat-foamable olefinic resin composition and process for production of olefinic resin foam from said composition. 4,510,031, Cl. 204-159.200.

Matsuoka, Hiroo; Matsuoka, Seiichi; Yamabe, Tsunekichi; Fujie, Hirokazu; Mori, Kenji; Tamura, Kouji; Yamada, Masatoshi; and Furuta, Akio, to JGC Corporation. Process for the preparation of a catalyst for the synthesis of methane. 4,510,264, Cl. 502-328.000.

Matsuoka, Seiichi: *See*—
Matsuoka, Hiroo; Matsuoka, Seiichi; Yamabe, Tsunekichi; Fujie, Hirokazu; Mori, Kenji; Tamura, Kouji; Yamada, Masatoshi; and Furuta, Akio, 4,510,264, Cl. 502-328.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Honjo, Katsuhiko; Taki, Hiromitsu; and Sato, Noriya, 4,510,179, Cl. 427-96.000.
Hotta, Shu; Hosaka, Tomiharu; and Shimotsuma, Wataru, 4,510,089, Cl. 260-396.00N.
Inaba, Ritsuo; and Wasa, Kiyotaka, 4,510,443, Cl. 324-120.000.
Irikura, Tsutomu, 4,510,554, Cl. 361-433.000.
Maruyama, Teruo; and Yamauchi, Shinya, 4,509,905, Cl. 418-75.000.
Tanabe, Kenzo; and Shimizu, Keiichiro, 4,510,517, Cl. 357-34.000.

Matsushita Electric Works, Ltd.: *See*—
Kakumoto, Hiromi; Ihara, Shinji; Iguchi, Yoji; and Miyata, Makoto, 4,509,259, Cl. 30-34.100.

Matsushita Electronics Corporation: *See*—
Ogata, Yoshiro; Yamazaki, Haruo; and Akutsu, Hidezoh, 4,510,415, Cl. 313-493.000.

Matsushita, Shigetada; and Doi, Yuji, to Fuji Electric Co., Ltd.; and Nippon Steel Corporation. Flow meter for a two-phase fluid. 4,509,366, Cl. 73-861.020.

Matsushita, Yoshihiro: *See*—
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,510,138, Cl. 514-206.000.

Matsuzaka, Syoji; Kajiwara, Makoto; Miyoshi, Masanobu; and Yamashita, Kiyoshi, to Konishiroku Photo Industry Co., Ltd. Silver halide photographic emulsion. 4,510,234, Cl. 430-557.000.

Matsuzaki, Masatoshi: *See*—
Yamazaki, Toshinori; Nomori, Hiroyuki; Matsuzaki, Masatoshi; Shima, Tetsuo; and Myokan, Isao, 4,510,224, Cl. 430-57.000.

Mattel, Inc.: *See*—
Girton, Virgil M.; Marason, Gabriel, Jr.; and Wang, Lawrence C., 4,510,590, Cl. 369-63.000.
Lambert, Gerard L.; and Saffer, Gary M., 4,509,931, Cl. 446-462.000.
Welman, Cornelis M., 4,510,385, Cl. 250-203.00R.

Mattingly, William R., Jr., to Matrix Science Corporation. Electrical connector shell assembly with continuous annular seal. 4,509,814, Cl. 339-93.00R.

Mauch, Gunter: *See*—
Schutz, Karl H.; and Mauch, Gunter, 4,509,364, Cl. 73-118.000.

Maurer, Albrecht: *See*—
Bottcher, Wolfgang; Juttner, Heinz; Maurer, Albrecht; and Stutzinger, Ferdinand, 4,509,295, Cl. 51-49.000.

Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V.: *See*—
Neher, Erwin, 4,510,442, Cl. 324-99.00R.

May, Francis A.; and Patts, Larry, to Consolidation Coal Company. Trolley pole. 4,510,352, Cl. 191-64.000.

Mayer, Albert: *See*—
Pflaum, August; and Mayer, Albert, 4,509,733, Cl. 270-41.000.

Mayer, Ferdy. RF Absorptive line with controlled low pass cut-off frequency. 4,510,468, Cl. 333-1Z.000.

Maynard, Roosevelt, Jr.: *See*—
Vahratian, Adam; Maynard, Roosevelt, Jr.; Croswhite, Howard L.; and Liang, Po-Lung, 4,509,389, Cl. 74-695.000.

Mayo, Franklin W.; and Smither, Miles A., to Geosource Inc. Electronic filter. 4,510,585, Cl. 367-43.000.

Mazda Motor Company: *See*—
Oishi, Masatoshi, 4,509,355, Cl. 72-325.000.

Mazda Motor Corporation: *See*—
Nagamoto, Yoshihito; and Ozeki, Sadao, 4,509,790, Cl. 296-204.000.

Mazzoni, Aldo, to Costruzioni Meccaniche G. Mazzoni S.p.A. High efficiency, fast extruders for extruding and refining soap and detergents. 4,510,110, Cl. 264-176.00R.

McCarroll, John J.: *See*—
Joyner, Richard W.; McCarroll, John J.; and Tennison, Stephen R., 4,510,071, Cl. 252-373.000.

McClanahan, John B.; LaVoie, Marvin E.; Kelsoe, Wayne E.; and Wrobel, James, to Tektronix, Inc. Protective circuit for electronic test probes. 4,510,482, Cl. 338-24.000.

McCombs, Norman R., to Greene & Kellogg, Inc. Modular industrial oxygen concentrator. 4,509,959, Cl. 55-161.000.

McCormick & Company, Inc.: *See*—
Staley, Lorie L.; and Pelaez, Joaquin, 4,510,164, Cl. 426-331.000.

McCormick, David D.: *See*—
Whittenburg, Stephen L.; McCormick, David D.; Tweed, William J.; Ozgunay, A. Aykut; and Williams, James T., 4,509,412, Cl. 99-331.000.

McDonnell Douglas Corporation: *See*—
Barajas, Felix, 4,509,994, Cl. 148-24.000.

McFarlane, Richard H. Flow control device. 4,509,946, Cl. 604-246.000.

McGahan, Mark J. Systematic color reference. 4,509,853, Cl. 355-35.000.

McGarry, Richard A.; and Noiles, Douglas G., to United States Surgical Corporation. Apparatus for applying surgical clips. 4,509,518, Cl. 128-325.000.

McGowan, William M., to Lea Manufacturing Company, The. Solution and process for treating copper and copper alloys. 4,510,018, Cl. 156-666.000.

McGraw-Edison Company: *See*—
Kristofek, Paul J., 4,510,559, Cl. 362-269.000.

McInroy, John W.: *See*—
Chang, Philip Y.; and McInroy, John W., 4,510,567, Cl. 364-300.000.
McInturff, Joe A.; and Patterson, David W., to Lockheed Corporation. Tachometer generator indexing device. 4,509,367, Cl. 73-457.000.
McJohnson, Robert B.: *See*—
Paranjpe, Suresh C.; and McJohnson, Robert B., 4,510,503, Cl. 346-75.000.
McKee, Fount E.: *See*—
Eicher, Dean A.; and McKee, Fount E., 4,509,552, Cl. 137-557.000.
McKibben, Jerry, to Coats & Clark, Inc. Vibration damper for string musical instrument. 4,509,399, Cl. 84-216.000.
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., to Wirtz Manufacturing Company, Inc. Machine for continuously casting battery grids. 4,509,581, Cl. 164-479.000.
McLaren, Barry D.: *See*—
Barnes, Stephen R.; Tarbox, Gary L.; Huntsman, Lee L.; and McLaren, Barry D., 4,509,526, Cl. 128-663.000.
McLaughlin, Robert C.: *See*—
Edwards, Ivan L.; McLaughlin, Robert C.; and Macrander, Max S., 4,510,462, Cl. 331-1.00A.
McMillon, Carlos H., to Mack's Guns. Sight and scope conversion mounting. 4,509,282, Cl. 42-1.0ST.
McStravick, David M.: *See*—
Chenoweth, David V.; and McStravick, David M., 4,509,599, Cl. 166-370.000.
McTamaney, Louis S.; Delfino, Allan B.; and Bisbee, Gary W., to FMC Corporation. Method and apparatus for detecting problems in sucker-rod well pumps. 4,509,901, Cl. 417-18.000.
McVicker, Gary B., to Exxon Research and Engineering Company. Magnesium group VIII transition metal carbonyl complex. 4,510,096, Cl. 260-439.00R.
Mead Corporation, The: *See*—
Paranjpe, Suresh C.; and McJohnson, Robert B., 4,510,503, Cl. 346-75.000.
Mead, Robert H.: *See*—
Ledvina, Timothy J.; and Mead, Robert H., 4,509,323, Cl. 59-8.000.
Ledvina, Timothy J.; and Mead, Robert H., 4,509,937, Cl. 474-213.000.
Meade, Steven L.; Morris, Merle E.; and Rice, Lawrence M., to GTE Products Corporation. Filament support for tubular lamp. 4,510,416, Cl. 313-579.000.
Meade, Steven L.: *See*—
Morris, Merle E.; Meade, Steven L.; and Rice, Lawrence M., 4,509,928, Cl. 445-27.000.
Mecaniques de Mulhouse Societe Alsacienne de Constructions: *See*—
Gosciniak, Guy; Juillard, Yves; Menissier, Pierre; and Moessinger, Albert, 4,509,563, Cl. 139-443.000.
Medical College of Wisconsin, Inc., The: *See*—
Brown, Charles E., 4,510,450, Cl. 324-321.000.
Medline AB: *See*—
Brundin, Jan-Olof, 4,509,504, Cl. 128-1.00R.
Medlock, Dan. Radiator filler neck refacing tool. 4,509,394, Cl. 82-4.00R.
Meditronic, Inc.: *See*—
Lattin, Gary A., 4,509,947, Cl. 604-266.000.
Mee, William W.: *See*—
Govang, James A.; Mee, William W.; and de Gruchy, Robert S., 4,509,648, Cl. 211-70.600.
Mehada, Masashi; Yoshimura, Shozo; Yamaguchi, Kenshiro; and Iwao, Osamu, to Toyo Aluminium Kabushiki Kaisha. Composite aluminum foil for use as electrode in electrolytic capacitor. 4,510,207, Cl. 428-607.000.
Mehlan, Bernd; and Gress, Josef, to Sielaff GmbH & Co. Automatenbau Herrieden. Automatic dispensing machine having a cooling unit. 4,509,339, Cl. 62-450.000.
Mehta, Aspy K., to Union Carbide Corp. Oiled, electrically conductive carbon black. 4,510,078, Cl. 252-510.000.
Meier, Walter: *See*—
Jacobsen, Jan, 4,509,832, Cl. 350-420.000.
Meiji Seika Kaisha Ltd.: *See*—
Minowa, Nobuto; Fukatsu, Shunzo; Niida, Taro; and Mase, Sadaaki, 4,510,102, Cl. 260-941.000.
Meinan Machinery Works, Inc.: *See*—
Takagi, Yukio, 4,510,009, Cl. 156-353.000.
Meiring, Willem J., to Tobacco Research & Development Institute Limited. Weighbelt apparatus. 4,509,609, Cl. 177-1.000.
Meldrum, Kent J. Wrist or armband for holding camera. 4,509,667, Cl. 224-250.000.
Melinat, Wolfgang: *See*—
Baynes, Gene P.; and Melinat, Wolfgang, 4,509,619, Cl. 188-73.390.
Melocik, Kurt B., to Caterpillar Tractor Co. Pressure reducing valve for dead engine lowering. 4,509,406, Cl. 91-453.000.
Mena, Walter M.: *See*—
Cooper, Ralph M.; and Mena, Walter M., 4,509,710, Cl. 248-73.000.
Mengel, Rudolf; Schroder, Ludwig; Stransky, Werner; Linden, Gerbert; Schneider, Gerhart; and Lust, Sigmund, to Celamerck GmbH & Co. KG. N-Pteridinyl-ureas. 4,509,972, Cl. 71-92.000.
Menissier, Pierre: *See*—
Gosciniak, Guy; Juillard, Yves; Menissier, Pierre; and Moessinger, Albert, 4,509,563, Cl. 139-443.000.
Menlove, Howard O.: *See*—
Phillips, John R.; Halbig, James K.; Menlove, Howard O.; and Klosterbuer, Shirley F., 4,510,117, Cl. 376-257.000.
Mentzell Electric Co., Inc.: *See*—
Mentzell, Walter J.; and Ganoe, Oscar L., 4,509,377, Cl. 73-862.560.
Mentzell, Walter J.; and Ganoe, Oscar L., to Mentzell Electric Co., Inc. Load testing. 4,509,377, Cl. 73-862.560.
Mercey, Gilles; Picard, Claude; and Saint-Martin, Bernard, to La Calhene Societe Anonyme. Isolator for confining and transporting human beings in a sterile atmosphere. 4,509,505, Cl. 128-1.00B.
Merchant, Donald K., to Airpax Corporation. PC-board mounted thermal breaker. 4,510,479, Cl. 337-91.000.
Mercier, Marc: *See*—
Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, 4,510,255, Cl. 502-10.000.
Merck & Co., Inc.: *See*—
Blacklock, Thomas J.; and Shuman, Richard F., 4,510,083, Cl. 260-112.50R.
Blaine, Edward H.; Cragoe, Edward J., Jr.; Hirschmann, Ralph F.; Nancarrow, John F., deceased; Nancarrow, Elisabeth M., executrix; and Tobert, Jonathan A., 4,510,322, Cl. 514-255.000.
Smith, Robert L.; and Graham, Samuel L., 4,510,155, Cl. 514-276.000.
Merck Patent Gesellschaft mit beschrankter Haftung: *See*—
Bernhard, Horst, 4,509,988, Cl. 106-308.00R.
Eidenschink, Rudolf; Haas, Gunther; Pohl, Ludwig; Romer, Michael; Scheuble, Bernhard; and Weber, Georg, 4,510,069, Cl. 252-299.610.
Mercz, Jeno: *See*—
Bar, Vilmos; Boszormenyi, Jozsef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,510,147, Cl. 514-314.000.
Merritt, Francis L.; and Taylor, Charles H., to United States of America, Air Force. Small cartridge heater. 4,510,377, Cl. 219-550.000.
Mesa Technology: *See*—
Barber, Larry J., 4,510,017, Cl. 156-651.000.
Messer Griesheim GmbH: *See*—
Geber, Hans, 4,509,977, Cl. 75-59.000.
Messerschmitt-Boelkow-Blohm GmbH: *See*—
Dettfurth, Karl; and Dettfurth, Bernd, 4,509,308, Cl. 52-787.000.
Mestetsky, Thomas: *See*—
Sak, Dennis A.; and Mestetsky, Thomas, 4,510,621, Cl. 383-89.000.
Methanol Chemie Nederland V.o.F.: *See*—
Hoetjer, Jan J., 4,510,278, Cl. 524-14.000.
Metrawatt GmbH: *See*—
Haussel, Werner; Roppelt, Gunter; and Kindermann, Robert, 4,510,444, Cl. 324-121.00R.
Metropolitan Wire Corporation: *See*—
Welsch, John H.; Chapko, John J.; and Carver, Robert J., 4,509,805, Cl. 312-210.000.
Meyer, Gunter: *See*—
Glembin, Dirk; Huhn, Kurt; Meyer, Gunter; and Thallmeier, Manfred, 4,510,334, Cl. 568-643.000.
Meyer, Horst: *See*—
Wehinger, Egbert; Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Towart, Robertson; Stoepel, Kurt; and Kazda, Stanislay, 4,510,310, Cl. 546-321.000.
Meyer, Rolf-Volker; Kreuder, Hans-Joachim; and Hohl, Erwin, to Bayer Aktiengesellschaft. Cyclic amidines, a process for their production and their use as catalysts in the hardening of epoxide resins. 4,510,288, Cl. 525-111.000.
Meyer, Willy; and Fury, Werner, to Ciba-Geigy Corporation. Phenyl sulfonamides. 4,510,325, Cl. 564-89.000.
Meyes, Peter, to Sandoz Ltd. Insection compositions containing quinalphos and thiometon. 4,510,137, Cl. 514-80.000.
Meynell Valves Limited: *See*—
Bendall, Brian; and Flannery, Stephen W., 4,509,677, Cl. 236-122.000.
Micaelli, Alain: *See*—
Guittet, Jack; Marchal, Paul; Micaelli, Alain; and Vertut, Jean, 4,510,574, Cl. 364-513.000.
Michaels, Paul A.; and Kaleita, David L., to Lectron Products, Inc. Memory power seat controller. 4,510,426, Cl. 318-565.000.
Michalak, Stanislaw; and Hermanns, Bernd, to Apparatebau Rothemuhle Brandt & Kritzler GmbH. Heat-transferring elements for regenerative heat exchange in gas-gas fluidized bed heat exchangers. 4,509,584, Cl. 165-10.000.
Michel, Gudrun E.: *See*—
Boehlke, Horst R. E.; Loschen, Gerriet K. H.; Michel, Gudrun E.; and Muller, Bernd, 4,510,323, Cl. 514-530.000.
Michele, Andres: *See*—
Simone, Pregermain; Henri, Charcosset; and Michele, Andres, 4,510,039, Cl. 208-10.000.
Mico Datensysteme GmbH: *See*—
Walter, Hans-Jurgen, 4,510,382, Cl. 235-380.000.
Micro Plastics Inc.: *See*—
Hill, Royce W., 4,509,890, Cl. 411-337.000.
Microdynamics, Inc.: *See*—
Martell, Charles R.; Leslie, Elmer N.; and Treadwell, Stephen S., 4,509,443, Cl. 112-262.100.
Mid-West Automation Inc.: *See*—
Eitzinger, Robert, 4,509,646, Cl. 209-573.000.
Mid-West Transformer Company: *See*—
Finkbeiner, Ernest, 4,510,478, Cl. 336-198.000.
Miele, Heinrich: *See*—
Tonnius, Dietrich; Weiss, Wolfgang; Orth, Winfried; Miele, Heinrich; and Pastorek, Emmerich, 4,510,090, Cl. 260-396.00R.
Miisho, Kazuyuki: *See*—
Nagumo, Shinichi; Ofuji, Hiromichi; and Miisho, Kazuyuki, 4,509,481, Cl. 123-407.000.
Milavec, Johann: *See*—
Furrer, Andreas; and Milavec, Johann, 4,510,457, Cl. 330-10.000.

Milberger, Lionel J.; and Bridges, Charles D., to Vetco Offshore, Inc. Mudline casing hanger assembly. 4,509,594, Cl. 166-208.000.
Milbright, Arnold M.: *See*—
Randle, Ronald E.; and Milbright, Arnold M., 4,509,303, Cl. 52-98.000.
Miles Laboratories, Inc.: *See*—
Johnson, Leighton C., deceased, 4,509,941, Cl. 494-45.000.
Whitted, Beth E.; and Boguslawski, George, 4,510,247, Cl. 435-207.000.
Miller, Matthew S., to General Electric Company. Microwave oven rack design. 4,510,362, Cl. 219-10.55E.
Miller, Peter: *See*—
Westwood, Robert; Miller, Peter; Ager, Ian R.; and Kay, David P., 4,510,143, Cl. 514-250.000.
Miller, Richard F.; and Nicholson, Michael P., to Atlantic Richfield Company. Method for minimizing fouling of heat exchanger. 4,510,041, Cl. 208-48.0AA.
Miller, Richard L.: *See*—
Scieri, Frank; and Miller, Richard L., 4,509,641, Cl. 206-219.000.
Miller, Steven P.; and Quan, Stella S. M., to Beckman Instruments, Inc. Double antibody immunoassays of enzymes such as prostatic acid phosphatase. 4,510,239, Cl. 435-7.000.
Mills, Donald F., to Mallinckrodt, Inc. Peptide-type substrates useful in the quantitative determination of endotoxin. 4,510,241, Cl. 435-23.000.
Mimeur, Jacques: *See*—
Andrie, Philippe; and Mimeur, Jacques, 4,509,263, Cl. 33-169.00R.
Minami, Syuji: *See*—
Oda, Hidekuni; Minami, Syuji; Inoue, Hiroshi; Matsuda, Akira; and Yamamoto, Yohzoh, 4,510,303, Cl. 526-282.000.
Minato, Shoji: *See*—
Kobayashi, Minoru; Sakai, Yoshiya; Minato, Shoji; Ooe, Tsuguo; Arai, Katsumi; and Suga, Tetsuo, 4,510,374, Cl. 219-146.100.
Minner, Willy; Krappel, Alfred; and Guggenmos, Johannes, to Telefunken Electronic GmbH; and Bayerische Motoren Werke AG. Electronically controlled ignition system. 4,509,482, Cl. 123-418.000.
Minnesota Mining and Manufacturing Company: *See*—
Chang, Robert W. H., 4,510,127, Cl. 424-52.000.
Daniels, Michael P., 4,510,593, Cl. 369-283.000.
Drahnak, Timothy J., 4,510,094, Cl. 260-429.0CY.
Gutman, Gustav, 4,510,236, Cl. 430-619.000.
Haugen, Orville C., 4,509,225, Cl. 15-256.510.
Windorski, David C.; and Kubiatowicz, David O., 4,509,506, Cl. 128-1.200.
Minolta Camera Kabushiki Kaisha: *See*—
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,509,846, Cl. 354-442.000.
Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, 4,509,842, Cl. 354-402.000.
Minowa, Nobuto; Fukatsu, Shunzo; Niida, Taro; and Mase, Sadaaki, to Meiji Seika Kaisha Ltd. Phosphinic acid esters and process for preparing the same. 4,510,102, Cl. 260-941.000.
Miranti, Joseph P., Jr.; and Brew, James K., to Dayco Corporation. Belt pulley and method of making the same. 4,509,933, Cl. 474-93.000.
Misaizu, Iwao: *See*—
Kuriyama, Katsumi; Kondo, Isao; and Misaizu, Iwao, 4,510,186, Cl. 427-381.000.
Mishuku, Toshio: *See*—
Iida, Hideyo; Kato, Koumei; Mishuku, Toshio; and Fujimaki, Yukiko, 4,510,195, Cl. 428-215.000.
Mistlberger, Bruno: *See*—
Schonberger, Johann; Bloo, Johann; Mistlberger, Bruno; and Gehmaier, Johann, 4,509,562, Cl. 139-13.00R.
Mita Industrial Co., Ltd.: *See*—
Fujii, Kanichi; and Otaka, Masahiro, 4,510,608, Cl. 372-87.000.
Mitamura, Gen, to Seiko Instruments & Electronics Ltd. Waterproof watchcase with multi-layered resin-coated glass. 4,509,866, Cl. 368-296.000.
Mitchell, James E.: *See*—
Coffman, Randall R.; and Mitchell, James E., 4,509,275, Cl. 34-126.000.
Mitchell, Stanley W.: *See*—
Jack, James M.; and Mitchell, Stanley W., 4,509,701, Cl. 241-292.000.
Mitel Corporation: *See*—
Lewis, Conrad, 4,510,597, Cl. 370-66.000.
Mitsubishi Chemical Industries Ltd.: *See*—
Yoshida, Kenji; Nakazawa, Makoto; Shike, Toyohiko; Tomida, Masayuki; Tsuda, Masataka; and Teraoka, Toru, 4,510,154, Cl. 514-365.000.
Mitsubishi Denki K.K.: *See*—
Fujikawa, Katsuhiro; and Gohda, Osamu, 4,509,445, Cl. 112-317.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
Ito, Tetsuro, 4,510,364, Cl. 219-69.00G.
Morishita, Akira, 4,510,406, Cl. 310-99.000.
Sugimoto, Akinori; and Sugimoto, Hiroshi, 4,509,374, Cl. 73-862.170.
Yagi, Shigenori; Kuzumoto, Masaki; Tanaka, Masaaki; and Ogawa, Shuji, 4,510,606, Cl. 372-25.000.
Yokota, Mitsuyoshi; and Matsumoto, Akio, 4,510,425, Cl. 318-484.000.
Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Watabe, Shin, 4,509,586, Cl. 165-29.000.
Mitsubishi Monsanto Chemical Co., Ltd.: *See*—
Kajita, Masaki; Nakaya, Tomio; Hasegawa, Shinichi; and Fujita, Hisanori, 4,510,515, Cl. 357-17.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Tsubai, Yasuo; Takaya, Yoshikazu; and Kanada, Eiji, 4,510,228, Cl. 430-204.000.
Mitsubishi Rayon Co., Ltd.: *See*—
Kishida, Kazuo; Sasaki, Isao; Mukai, Nobuhiro; and Asai, Hajime, 4,510,024, Cl. 204-59.00R.
Kishimura, Masaaki; and Arakawa, Nobuyuki, 4,510,279, Cl. 524-144.000.
Mitsuboshi Belting Ltd.: *See*—
Takano, Hiroshi; Yokoyama, Hiroshi; and Mizuno, Takahide, 4,510,113, Cl. 264-257.000.
Mitsuchi Corporation: *See*—
Okada, Hiroshi, 4,509,724, Cl. 254-126.000.
Mitsui Petrochemical Industries, Ltd.: *See*—
Miura, Yoshikazu; Horimoto, Koji; and Sumida, Takenori, 4,510,273, Cl. 523-406.000.
Oda, Hidekuni; Minami, Syuji; Inoue, Hiroshi; Matsuda, Akira; and Yamamoto, Yohzoh, 4,510,303, Cl. 526-282.000.
Mitsui Toatsu Chemicals, Inc.: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; and Yokote, Sachio, 4,510,079, Cl. 252-511.000.
Miura, Kuniaki; Shibata, Akira; Yamada, Jun; and Hazama, Katashi, to Hitachi, Ltd. Signal reproducing circuit for a video tape recorder. 4,510,530, Cl. 358-314.000.
Miura, Yoshikazu; Horimoto, Koji; and Sumida, Takenori, to Mitsui Petrochemical Industries, Ltd. Thixotropic agent. 4,510,273, Cl. 523-406.000.
Miwa, Hirohide, to Fujitsu Limited. Ultrasonic medium characterization system. 4,509,524, Cl. 128-660.000.
Miyadera, Yasuo: *See*—
Hoshi, Ikuo; Arai, Masami; Yokochi, Kiyoshi; Miyadera, Yasuo; Fujioka, Atsushi; and Nakagawa, Takehisa, 4,510,008, Cl. 156-245.000.
Miyaguchi, Hiroshi; and Takeuchi, Hisaharu, to Tokyo Shibaura Denki Kabushiki Kaisha. Signal encoder using orthogonal transform. 4,510,578, Cl. 364-725.000.
Miyake, Masao; and Akita, Teruo, to Asahi Kasei Textiles Ltd. Heat-retaining moisture-transmissible water-resistant fabric. 4,510,194, Cl. 428-212.000.
Miyake, Takashi: *See*—
Ikemoto, Kazuhito; Terakura, Yukio; Miyake, Takashi; and Yamamoto, Takashi, 4,509,381, Cl. 74-413.000.
Miyake, Yasuo: *See*—
Sakashita, Shigeru; Nakagawa, Takeshi; Ohwaki, Takayuki; and Miyake, Yasuo, 4,510,168, Cl. 427-3.000.
Miyamoto, Shoji: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, 4,510,492, Cl. 340-825.050.
Miyashita, Teruo; and Yoshida, Koichi, to Nippon Light Metal Company Limited. Method for cathodic protection of aluminum material. 4,510,030, Cl. 204-147.000.
Miyata, Makoto: *See*—
Kakumoto, Hiromi; Ihara, Shinji; Iguchi, Yoji; and Miyata, Makoto, 4,509,259, Cl. 30-34.100.
Miyauchi, Hirotsugu: *See*—
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,510,328, Cl. 568-32.000.
Miyauchi, Tateoki: *See*—
Okunaka, Masaaki; Mizukoshi, Katsuro; Hongo, Mikio; and Miyauchi, Tateoki, 4,510,222, Cl. 430-5.000.
Miyoshi, Masanobu: *See*—
Matsuzaka, Syoji; Kajiwara, Makoto; Miyoshi, Masanobu; and Yamashita, Kiyoshi, 4,510,234, Cl. 430-557.000.
Mizokami, Kazunori, to Olympus Optical Company Ltd. Apparatus for controlling the emission of an electronic flash. 4,509,845, Cl. 354-420.000.
Mizokawa, Sadao; Hamada, Takuji; Tomizawa, Hiroshi; and Fushimi, Hitoshi, to Hitachi, Ltd. Loop type data highway system. 4,510,494, Cl. 340-825.050.
Mizukoshi, Katsuro: *See*—
Okunaka, Masaaki; Mizukoshi, Katsuro; Hongo, Mikio; and Miyauchi, Tateoki, 4,510,222, Cl. 430-5.000.
Mizuno, Chiaki: *See*—
Ogawa, Hiroshi; Mizuno, Chiaki; and Tamai, Yasuo, 4,510,203, Cl. 428-425.900.
Mizuno, Takahide: *See*—
Takano, Hiroshi; Yokoyama, Hiroshi; and Mizuno, Takahide, 4,510,113, Cl. 264-257.000.
Mizushima, Kouji: *See*—
Kanno, Takashi; Oka, Akira; Okamoto, Ituo; Mizushima, Kouji; and Oguro, Shinji, 4,510,552, Cl. 361-413.000.
Mizutani, Yasukazu: *See*—
Ubukata, Susumu; Mizutani, Yasukazu; and Iyoda, Syozo, 4,510,481, Cl. 337-368.000.
Mizzi, John V.: *See*—
Curtis, Huntington W.; Dodge, Frederick A.; Francis, David B.; and Mizzi, John V., 4,509,530, Cl. 128-710.000.
MKT-tehtaat Oy: *See*—
Granberg, Carl-Gustav; and Kauppi, Heikki, 4,509,413, Cl. 99-453.000.
Mobay Chemical Corporation: *See*—
Carter, Russell P., Jr., 4,510,196, Cl. 428-220.000.

Moberg, William K., to Du Pont de Nemours, E. I., and Company. Fungicidal 1,2,4-triazole derivatives. 4,510,136, Cl. 514-63.000.

Moberly, Charles W. Melt curing arylene sulfide polymers with oxygen. 4,510,297, Cl. 525-537.000.

Mobil Oil Corporation: *See*—
Braid, Milton; and Landis, Phillip S., 4,509,956, Cl. 44-68.000.
Dessau, Ralph M., 4,510,045, Cl. 208-111.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,510,043, Cl. 208-97.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,510,044, Cl. 208-111.000.
Win, Michael M., 4,509,432, Cl. 108-51.100.

Mochizuki, Zenichi: *See*—
Nakamura, Hiromi; Mochizuki, Zenichi; Motomura, Noriyuki; and Yamada, Sadayoshi, 4,510,371, Cl. 219-121.0LM.

Mockli, Peter, to Ciba Geigy Corporation. Dye mixtures of anthraquinone dyes. 4,510,088, Cl. 260-380.000.

Modern Equipment Company: *See*—
Bauer, Gerd F., 4,509,979, Cl. 75-130.00R.

Moessinger, Albert: *See*—
Gosciniak, Guy; Juillard, Yves; Menissier, Pierre; and Moessinger, Albert, 4,509,563, Cl. 139-443.000.

Mohr, Dieter; and Riess, Kurt, to Hoechst Aktiengesellschaft. Light-sensitive aqueous developable copying material and product by coating process thereof utilizing polyalloxane and alkylene oxide copolymer as coating aid. 4,510,227, Cl. 430-175.000.

Moller, Carl. Easel formed by two crossed tabs at back of display object. 4,509,712, Cl. 248-464.000.

Moller, Rainer: *See*—
Kleinert, Michael; Moller, Rainer; and Stelzer, Horst, 4,509,456, Cl. 118-715.000.

Mollere, Phillip D.: *See*—
Wiewiorowski, Tadeusz; and Mollere, Phillip D., 4,510,027, Cl. 204-110.000.

Molnar, Imre: *See*—
Zimber, Bela; and Molnar, Imre, 4,509,330, Cl. 60-537.000.

Momiyama, Kikuo, to Canon Kabushiki Kaisha. Light measurement device for single lens reflex camera. 4,509,849, Cl. 354-479.000.

Money, David K.; Swift, Stephen; MacLaurin, Andrew; and Frost, John G., to Telectronics Pty. Ltd. Physiological event recognition techniques for use with a delta modulator. 4,509,529, Cl. 128-708.000.

Mongelli, Julio. Multi-coin coin chute. 4,509,630, Cl. 194-1.00G.

Monk, Kermit R. Water temperature display and flow control apparatus. 4,509,550, Cl. 137-551.000.

Monsanto Company: *See*—
Mottus, Edward H., 4,510,285, Cl. 524-401.000.
Siebert, Oliver W., 4,510,171, Cl. 427-34.000.
Wu, Wan C., 4,510,287, Cl. 525-84.000.

Montedison S.p.A.: *See*—
Chiolle, Antonio; Vecchi, Alfio; and Credali, Lino, 4,510,185, Cl. 427-222.000.

Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, to International Flavors & Fragrances, Inc. Methyl substituted pinyl oxopentenes, organoleptic uses thereof and process for preparing same. 4,510,340, Cl. 568-884.000.

Mooney, J. Robert: *See*—
Currie, Janie K.; and Mooney, J. Robert, 4,510,342, Cl. 585-524.000.

Moore, John D.: *See*—
Bronner, James A.; Moore, John D.; and Dale, Paul R., 4,510,081, Cl. 252-603.000.

Morbin, Federico: *See*—
Costa, Armando; and Morbin, Federico, 4,510,345, Cl. 174-35.00R.

Morgan, Donald G.: *See*—
Chisholm, John P.; and Morgan, Donald G., 4,510,499, Cl. 343-456.000.

Morgan Flotation Systems: *See*—
Rhoton, Albert L., 4,509,218, Cl. 5-450.000.

Morgan, Walter R.; Boniface, Edmund A.; and Huben, Clayton A., to United States of America, Navy. Turbine engine cold temperature starting system. 4,509,325, Cl. 60-39.141.

Mori, Chuzo; Watanabe, Jun; and Kudo, Katsutaka, to Carl Manufacturing Co., Ltd. Punch and perforation jig assembly having position maintaining feature. 4,509,397, Cl. 83-453.000.

Mori, Hisakazu: *See*—
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, 4,510,270, Cl. 523-176.000.

Mori, Kei. Solar energy collection apparatus. 4,509,500, Cl. 126-425.000.

Mori, Kei. Ornamental lighting device. 4,510,555, Cl. 362-32.000.

Mori, Kenji: *See*—
Matsuoka, Hiroo; Matsuoka, Seiichi; Yamabe, Tsunekichi; Fujie, Hirokazu; Mori, Kenji; Tamura, Kouji; Yamada, Masatoshi; and Furuta, Akio, 4,510,264, Cl. 502-328.000.

Mori, Kenzo; Yasuda, Hyo; and Suzuki, Minoru, to Taiyo Musen Co. Ltd. Plate antenna for direction finder. 4,510,498, Cl. 343-435.000.

Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, to Hitachi, Ltd. Message communication method and system. 4,510,492, Cl. 340-825.050.

Mori, Nobuhiko, to Nippon Electric Co., Ltd. Character recognition system utilizing pattern matching method. 4,510,617, Cl. 382-33.000.

Mori, Tsutomu T.; Dybdal, Robert B.; and Etcheverry, Robert D., to United States of America, Air Force. High sensitivity millimeter-wave measurement apparatus. 4,510,622, Cl. 455-67.000.

Moriguchi, Fujio: *See*—
Moriguchi, Haruhiko; Moriguchi, Fujio; and Ohmori, Takashi, 4,510,506, Cl. 346-76.0PH.

Moriguchi, Haruhiko; Moriguchi, Fujio; and Ohmori, Takashi, to Fuji Xerox Co., Ltd. Recording apparatus. 4,510,506, Cl. 346-76.0PH.

Moriguchi, Yutaro; Honda, Makoto; and Izawa, Akira, to Dai Nippon Insatsu Kabushiki Kaisha. Rear projection screen. 4,509,823, Cl. 350-128.000.

Morimoto, Akira: *See*—
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,510,138, Cl. 514-206.000.

Morin, Rene' , to Renault Vehicules Industriels. Built-in hydraulic automatic device for advancing the injection of a diesel engine. 4,509,490, Cl. 123-502.000.

Morishita, Akira, to Mitsubishi Denki Kabushiki Kaisha. Multi-use starting device. 4,510,406, Cl. 310-99.000.

Morishita, Hajime; Akagi, Motoo; Nonogaki, Saburo; Hayashi, Nobuaki; and Uchino, Shoichi, to Hitachi, Ltd. Photosensitive composition and pattern forming process using same. 4,510,226, Cl. 430-144.000.

Morita, Seiichiro; Yuasa, Akihiko; and Arai, Takao, to Toshiba Kikai Kabushiki Kaisha. Boring machines. 4,509,236, Cl. 29-26.00A.

Moriya, Takashi: *See*—
Kurihara, Toshio; Kunita, Masao; Yasunaga, Makoto; Masuda, Katuya; Moriya, Takashi; and Oosawa, Seiichi, 4,509,421, Cl. 101-93.040.

Moriyama, Takashi. Method of and apparatus for baring the end of sheathed multicore cable. 4,509,257, Cl. 29-825.000.

Morris, Horton H.; Whyte, John R., Jr.; Forbus, Ellen; Dentan, Catherine M.; and Collins, David R. Method of treating zeolite ores to remove discoloring impurities and improve its brightness and resulting finely ground zeolite. 4,510,254, Cl. 501-146.000.

Morris, Merle E.; Meade, Steven L.; and Rice, Lawrence M., to GTE Products Corporation. Method of making high pressure tungsten halogen lamps. 4,509,928, Cl. 445-27.000.

Morris, Merle E.: *See*—
Meade, Steven L.; Morris, Merle E.; and Rice, Lawrence M., 4,510,416, Cl. 313-579.000.

Morszeck, Dieter. Suitcase. 4,509,622, Cl. 190-119.000.

Morton, Willard. Water-steam separator. 4,509,965, Cl. 55-399.000.

Moscovich, Ivan. Puzzle with elements transferable between closed-loop paths. 4,509,756, Cl. 273-153.00S.

Moss, Lionel V. Drip or trickle irrigation. 4,509,692, Cl. 239-542.000.

Moss Rosenberg Verft A/S: *See*—
Grondalen, Svein, 4,509,657, Cl. 220-436.000.

Mostek Corporation: *See*—
Dias, Donald R.; Guterman, Daniel C.; Proebsting, Robert J.; and Leuschner, Horst, 4,510,584, Cl. 365-203.000.

Motomura, Noriyuki: *See*—
Nakamura, Hiromi; Mochizuki, Zenichi; Motomura, Noriyuki; and Yamada, Sadayoshi, 4,510,371, Cl. 219-121.0LM.

Motoren-und Turbinen-Union Munchen GmbH: *See*—
Schmidt, Werner; and Jahn, Franz, 4,509,673, Cl. 228-212.000.

Motorola, Inc.: *See*—
Bickley, Robert H.; Bucher, Charles A.; and Yee, David M., 4,510,472, Cl. 333-262.000.
Dubois, Jerry M.; and Spanjer, Keith G., 4,510,519, Cl. 357-81.000.
Ellis, Ralph J.; Gurtler, Richard W.; and Sarma, Kalluri R., 4,510,015, Cl. 156-617.00R.
Paulson, Wayne M.; and Hughes, David W., 4,510,178, Cl. 427-94.000.
Rice, Craig W.; and Popek, Marc H., 4,510,465, Cl. 332-16.00T.
Thompson, Sharon E.; and Eastmond, Bruce C., 4,510,624, Cl. 455-223.000.
Utton, Charles G.; and Stratman, Bill D., 4,509,709, Cl. 244-118.100.

Mottus, Edward H., to Monsanto Company. Terpolymeric antitumor agent. 4,510,285, Cl. 524-401.000.

Mount, Bruce E., to Perkin-Elmer Corporation, The. Acoustical wave flowmeter with increased density capability. 4,509,372, Cl. 73-861.280.

Mouzin, Gilbert: *See*—
Cousse, Henry; Mouzin, Gilbert; Tarayre, Jean-Pierre; and Rieu, Jean-Pierre, 4,510,142, Cl. 514-255.000.

Mowbray, Dorian F., to Lucas Industries Public Limited Company. Fuel system for multi-cylinder engine. 4,509,487, Cl. 123-458.000.

Moyer, Mark C., to Exxon Production Research Co. Inspection apparatus for electromagnetically detecting flaws in the wall of a pipe. 4,510,447, Cl. 324-225.000.

MTS Systems Corporation: *See*—
Petersen, Paul S., 4,509,910, Cl. 425-451.900.

Mudge, Trevor N.: *See*—
Lougheed, Robert M.; and Mudge, Trevor N., 4,510,616, Cl. 382-8.000.

Mueller, Hans R.: *See*—
Bux, Werner K.; Keller, Heinrich J.; and Mueller, Hans R., 4,510,493, Cl. 340-825.050.

Mueller, Peter F.; and Caulfield, H. John, to Aerodyne Research, Inc. Method for writing holograms. 4,510,575, Cl. 364-518.000.

Mues, Volker: *See*—
Forster, Heinz; Hofer, Wolfgang; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,509,971, Cl. 71-90.000.

Muhle, Mike E.; Stolz, Richard J.; and Wright, Cecil W., to Exxon Research & Engineering Co. Method of finishing thermoplastic granules. 4,510,271, Cl. 523-346.000.

Muhlratzer, August: *See*—
Cornils, Boy; Tihanyi, Bela; Weber, Jurgen; DeWin, Werner; Erben, Edwin; and Muhlratzer, August, 4,510,182, Cl. 427-162.000.

Mukai, Nobuhiro: *See*—
Kishida, Kazuo; Sasaki, Isao; Mukai, Nobuhiro; and Asai, Hajime, 4,510,024, Cl. 204-59.00R.

Mullally, Charles J.; Brown, Steven L.; Anderson, David L.; and Hitchcock, Robert F., to Sealed Power Corporation. Accumulator-dehydrator assembly for an air conditioning system. 4,509,340, Cl. 62-503.000.

Mullaly, Maxine M. Wheel chair restraint. 4,509,797, Cl. 297-466.000.

Mullane, William I., Jr., to Procter & Gamble Company, The. Apparatus for uniformly debossing and aperturing a resilient plastic web. 4,509,908, Cl. 425-290.000.

Muller, Alexander, to Arntz-Optibelt KG. Toothed belt drives. 4,509,936, Cl. 474-148.000.

Muller, Bernd: *See*—
Boehike, Horst R. E.; Loschen, Gerriet K. H.; Michel, Gudrun E.; and Muller, Bernd, 4,510,323, Cl. 514-530.000.

Muller, Hans, to Heidelberger Druckmaschinen AG. Folding device for web-fed rotary printing presses. 4,509,939, Cl. 493-444.000.

Muller, Jurgen: *See*—
Stahl, Werner; and Muller, Jurgen, 4,509,736, Cl. 271-11.000.

Murakami, Hiroyasu: *See*—
Katsuma, Makoto; Hiramatsu, Akira; Arakawa, Kazuhiko; and Murakami, Hiroyasu, 4,509,848, Cl. 354-473.000.

Murakami, Kunihiko: *See*—
Nozawa, Ryoichiro; Kiya, Nobuyuki; and Murakami, Kunihiko, 4,510,427, Cl. 318-590.000.

Murata Manufacturing Co., Ltd.: *See*—
Maeba, Yukio, 4,510,562, Cl. 363-19.000.

Murata, Norio; Hoshino, Mitsutoshi; and Yamakawa, Shinzo, to Nippon Telegraph & Telephone Public Corporation. Protective packaging assembly and method. 4,509,820, Cl. 350-96.210.

Murray, Robert: *See*—
Flinn, Ian, deceased; and Murray, Robert, 4,510,471, Cl. 333-195.000.

Musha, Tohru: *See*—
Kato, Kiichi; Musha, Tohru; and Ito, Kenichi, 4,509,830, Cl. 350-394.000.

Mutschall, Hugo W.: *See*—
Focke, Heinz; and Mutschall, Hugo W., 4,509,310, Cl. 53-170.000.

Myokan, Isao: *See*—
Yamazaki, Toshinori; Nomori, Hiroyuki; Matsuzaki, Masatoshi; Shima, Tetsuo; and Myokan, Isao, 4,510,224, Cl. 430-57.000.

Naber, James R. Shotgun speed loader. 4,509,284, Cl. 42-87.000.

Nagamoto, Yoshihito; and Ozeki, Sadao, to Mazda Motor Corporation. Lower body structure of cab-over type automobiles. 4,509,790, Cl. 296-204.000.

Nagano, Katsumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Digital-to-analog converter. 4,510,486, Cl. 340-347.0DA.

Nagatani, Kazuo, to Sakurai Machine Trading Co., Ltd. Paper discharger in cylinder screen printing machine. 4,509,422, Cl. 101-118.000.

Nagumo, Shinichi; Ofuji, Hiromichi; and Miisho, Kazuyuki, to Nissan Motor Co., Ltd. Internal combustion engine with cooling system. 4,509,481, Cl. 123-407.000.

Nakagawa, Takehisa: *See*—
Hoshi, Ikuo; Arai, Masami; Yokochi, Kiyoshi; Miyadera, Yasuo; Fujioka, Atsushi; and Nakagawa, Takehisa, 4,510,008, Cl. 156-245.000.

Nakagawa, Takeshi: *See*—
Sakashita, Shigeru; Nakagawa, Takeshi; Ohwaki, Takayuki; and Miyake, Yasuo, 4,510,168, Cl. 427-3.000.

Nakagome, Hideki; and Yasuda, Satoshi, to Tokyo Shibaura Denki Kabushiki Kaisha. Magnetic refrigerator. 4,509,334, Cl. 62-6.000.

Nakagome, Makoto: *See*—
Inoue, Setsuro; Nikaido, Koichi; and Nakagome, Makoto, 4,510,192, Cl. 428-151.000.

Nakahashi, Ken-ichi: *See*—
Iba, Youich; Nakahashi, Ken-ichi; and Matsubara, Masaki, 4,509,838, Cl. 354-62.000.

Nakai, Kenji, to Aisan Kogyo Kabushiki Kaisha. Electromagnetic fuel injector. 4,509,693, Cl. 239-585.000.

Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, to Minolta Camera Kabushiki Kaisha. Camera system. 4,509,846, Cl. 354-442.000.

Nakai, Ryozo; Inoue, Shigeo; and Arai, Sumio, to Kao Corporation. Wood preservative composition. 4,510,074, Cl. 252-400.230.

Nakajima, Minoru: *See*—
Takeda, Shiro; and Nakajima, Minoru, 4,510,283, Cl. 524-356.000.

Nakajima, Mutsuhiko, to Ace Pak Company Incorporated. Automatic carton packing machine. 4,509,312, Cl. 53-375.000.

Nakamura, Hiromi; Mochizuki, Zenichi; Motomura, Noriyuki; and Yamada, Sadayoshi, to Toshiba Kikai Kabushiki Kaisha. Metallic scales and method of manufacturing the same. 4,510,371, Cl. 219-121.0LM.

Nakamura, Masao: *See*—
Tonokawa, Hiroshi; and Nakamura, Masao, 4,510,268, Cl. 521-146.000.

Nakamura, Masaru: *See*—
Takeuchi, Tooru; Nakamura, Masaru; and Aoishi, Eiji, 4,510,201, Cl. 428-285.000.

Nakamura, Masayoshi: *See*—
Hara, Noboru; Fukudome, Shinichi; Johna, Nobuo; and Nakamura, Masayoshi, 4,510,073, Cl. 252-383.000.

Nakanishi, Koichiro; and Hiratani, Hajime, to Japan Chemical Research Co., Ltd. Process for concentrating and purifying human urinary kallikrein. 4,510,248, Cl. 435-226.000.

Nakanishi, Masayuki, to Idemitsu Kosan Co., Ltd. Refrigeration oil composition. 4,510,062, Cl. 252-45.000.

Nakaya, Tomio: *See*—
Kajita, Masaki; Nakaya, Tomio; Hasegawa, Shinichi; and Fujita, Hisanori, 4,510,515, Cl. 357-17.000.

Nakaya, Toshiharu: *See*—
Ihikura, Shinichi; Kanda, Kazunori; and Nakaya, Toshiharu, 4,510,275, Cl. 523-412.000.

Nakayama, Takashi: *See*—
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, 4,509,321, Cl. 57-328.000.

Nakazawa, Makoto: *See*—
Yoshida, Kenji; Nakazawa, Makoto; Shike, Toyohiko; Tomida, Masayuki; Tsuda, Masataka; and Teraoka, Toru, 4,510,154, Cl. 514-365.000.

Nalco Chemical Company: *See*—
Davis, Kevin M.; Wahl, Timothy M.; Beckman, John A.; and Isele, Karl J., Jr., 4,509,727, Cl. 266-44.000.

Nancarrow, Elisabeth M., executrix: *See*—
Blaine, Edward H.; Cragoe, Edward J., Jr.; Hirschmann, Ralph F.; Nancarrow, John F., deceased; Nancarrow, Elisabeth M., executrix; and Tobert, Jonathan A., 4,510,322, Cl. 514-255.000.

Nancarrow, John F., deceased: *See*—
Blaine, Edward H.; Cragoe, Edward J., Jr.; Hirschmann, Ralph F.; Nancarrow, John F., deceased; Nancarrow, Elisabeth M., executrix; and Tobert, Jonathan A., 4,510,322, Cl. 514-255.000.

Nardi, Dante; Catto, Alberto; Tajana, Alberto; Cazzulani, Pietro; and Graziani, Gabriele, to Recordeti S.A. Therapeutically effective ω-(4-(2-pyridyl)-piperazino)-alkanoylanilides. 4,510,140, Cl. 544-360.000.

Nash, Donald R., to Allied Corporation. Small engine ignition system with spark advance. 4,509,493, Cl. 123-602.000.

Nashimoto, Junichi; and Kurokawa, Zenkichi, to Okamura Corporation. Device for storing and retrieving articles in a shelf stack. 4,509,893, Cl. 414-280.000.

Nate, Kazuo: *See*—
Yuhara, Akitsuna; Nate, Kazuo; Toyama, Tatsuro; and Yamada, Jun, 4,510,410, Cl. 310-313.00D.

National Research Development Corporation: *See*—
Grimbleby, James B.; and Talbot, Christopher G., 4,510,384, Cl. 250-201.000.

National Starch and Chemical Corporation: *See*—
Lenchin, Julianne M.; Trubiano, Paolo C.; and Hoffman, Stella, 4,510,166, Cl. 426-565.000.
Rossi, Robert D.; and Ray-Chaudhuri, Dilip K., 4,510,324, Cl. 564-82.000.

Nawa, Masayoshi: *See*—
Nogami, Takashi; and Nawa, Masayoshi, 4,510,216, Cl. 429-101.000.

Naysmith, Peter: *See*—
Foresi, Anthony; and Naysmith, Peter, 4,509,740, Cl. 271-224.000.

NCR Canada Ltd - NCR Canada LTEE: *See*—
Ataman, Ergin'; and King, J. Thomas, 4,510,618, Cl. 382-54.000.

NCR Corporation: *See*—
Gorin, Brian A.; and Ho, Ping-Pei, 4,510,221, Cl. 430-1.000.
Ho, Ping-Pei; Gorin, Brian A.; and Bora, Nayana S., 4,509,817, Cl. 350-3.610.

NEC Corporation: *See*—
Shimogawara, Jun, 4,509,872, Cl. 400-144.100.
Tamura, Yoshiharu, 4,510,460, Cl. 330-285.000.

Neelameggham, Ramaswami; Priscu, John C.; and Toomey, Robert D., to AMAX Inc. Molten salt electrostripping cell and method for purifying molten salt electrolytes. 4,510,029, Cl. 204-130.000.

Negishi, Masataka. Device for controlling light images. 4,510,560, Cl. 362-299.000.

Negro, Guido: *See*—
Schall, Walter; Negro, Guido; Hipp, Martin; and Albrecht, Hans, 4,509,396, Cl. 83-126.000.

Neber, Erwin, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften e.V. Measuring system for exceedingly weak currents. 4,510,442, Cl. 324-99.00R.

Nelle, Guenther, to Dr. Johannes Heidenhain GmbH. Mounting arrangement for length measuring device. 4,509,262, Cl. 33-125.00R.

Nelson, Kenneth L., to King-Seeley Thermos Co. Method of making an ice making apparatus. 4,510,114, Cl. 264-261.000.

Nelson, Siewart C., to Automatic Orange Juicer Corp., The. Surface for supporting cut fruit in fruit juicer. 4,509,418, Cl. 100-97.000.

Nemitz, Anthony R., to Arrow Display Company, Inc. Method and kit for construction of custom prototype membrane switch panel. 4,510,353, Cl. 200-5.00A.

Nesheiwat, Afif M.: *See*—
Cleary, James W.; Sherk, Fred T.; and Nesheiwat, Afif M., 4,510,316, Cl. 548-555.000.

Nestec S.A.: *See*—
Gejl-Hansen, Frederik, 4,510,163, Cl. 426-241.000.
Svengren, Anders G., 4,509,700, Cl. 241-280.000.

Netto, Daniel J.: *See*—
Sobin, Sidney S.; and Netto, Daniel J., 4,509,877, Cl. 403-41.000.

Neufeld, John A. Method and apparatus for corrective osteotomy. 4,509,511, Cl. 128-92.00H.

Neveri, Istvan: *See*—
Boday, Otto ; Herpay, Andras; Krajcsovics, Ferenc; Neveri, Istvan; Pete, Sandor; Pocsy, Ferenc; Szikora, Bela; and Szirmai, Endre, 4,509,434, Cl. 110-238.000.

Newport Pharmaceuticals International: *See*—
Hadden, John W.; Simon, Lionel N.; and Giner-Sorolla, Alfredo, 4,510,144, Cl. 514-257.000.

Newton, Ronald O.; and Wright, Eric, to General Signal Corporation. Fluid pressure brake control systems for freight locomotives. 4,509,801, Cl. 303-8.000.

Nezat, Jerry W., to Creative Research & Development, Inc. Composition for absorbing oxygen and carrier therefore. 4,510,162, Cl. 426-124.000.

Nguyen, Huy X.: *See*—
Earl, Robert B.; Larson, David B.; and Nguyen, Huy X., 4,509,598, Cl. 166-308.000.

Niagara Blower Company: *See*—
Kals, Walter, 4,509,591, Cl. 165-122.000.

Nicholson, Michael P.: *See*—
Miller, Richard F.; and Nicholson, Michael P., 4,510,041, Cl. 208-48.0AA.

Niida, Taro: *See*—
Minowa, Nobuto; Fukatsu, Shunzo; Niida, Taro; and Mase, Sadaaki, 4,510,102, Cl. 260-941.000.

Nijman, John P., to Allied Corporation. Method and apparatus for reshaping and polishing an end face of an optical fiber. 4,510,005, Cl. 156-221.000.

Nikaido, Koichi: *See*—
Inoue, Setsuro; Nikaido, Koichi; and Nakagome, Makoto, 4,510,192, Cl. 428-151.000.

Nikles, Francois: *See*—
Cleusix, Willy; and Nikles, Francois, 4,509,867, Cl. 368-321.000.

Nippon Electric Co., Ltd.: *See*—
Mori, Nobuhiko, 4,510,617, Cl. 382-33.000.
Nishitoba, Shigeo; and Fukaya, Hirokazu, 4,509,494, Cl. 123-609.000.

Nippon Kogaku K.K.: *See*—
Hakamata, Kazuo; Takagi, Tadao; and Hyodo, Yukio, 4,510,411, Cl. 310-316.000.
Hasegawa, Hiroshi, 4,509,843, Cl. 354-412.000.
Maida, Onamu; Takemae, Mikio; and Okubo, Yuji, 4,509,847, Cl. 354-442.000.

Nippon Light Metal Company Limited: *See*—
Miyashita, Teruo; and Yoshida, Koichi, 4,510,030, Cl. 204-147.000.

Nippon Notion Kogyo Co., Ltd.: *See*—
Kanzaka, Yoshihiro, 4,509,232, Cl. 24-113.00R.

Nippon Oil and Fats Company, Ltd.: *See*—
Ishizaki, Takaharu; Kimura, Tsuneo; and Yamazaki, Shingo, 4,509,954, Cl. 44-62.000.

Nippon Paint Co., Ltd.: *See*—
Ihikura, Shinichi; Kanda, Kazunori; and Nakaya, Toshiharu, 4,510,275, Cl. 523-412.000.

Nippon Piston Ring Co., Ltd.: *See*—
Ebihara, Tadashi, 4,509,722, Cl. 251-359.000.

Nippon Sheet Glass Co., Ltd.: *See*—
Yamasaki, Tetsuya; Okuda, Eiji; and Yamamoto, Noboru, 4,509,824, Cl. 350-167.000.

Nippon Steel Corporation: *See*—
Hada, Takashi; Kanamaru, Tatsuya; and Ogawa, Yutaka, 4,510,209, Cl. 428-659.000.
Matsushita, Shigetada; and Doi, Yuji, 4,509,366, Cl. 73-861.020.

Nippon Telegraph & Telephone Public Corporation: *See*—
Murata, Norio; Hoshino, Mitsutoshi; and Yamakawa, Shinzo, 4,509,820, Cl. 350-96.210.

Nippon Zenn Co. Ltd.: *See*—
Kubo, Yoichiro; Kohtaki, Takaaki; and Oura, Kiyomori, 4,510,293, Cl. 525-338.000.

Nippondenso Co., Ltd.: *See*—
Kanayama, Kenji, 4,510,409, Cl. 310-268.000.
Takao, Mitsunori; and Kimura, Takahiko, 4,509,477, Cl. 123-339.000.
Takao, Mitsunori; and Ban, Toshika, 4,510,569, Cl. 364-431.120.

Nishiguchi, Ikuzo: *See*—
Matsubara, Yoshiharu; Hirashima, Tsuneaki; and Nishiguchi, Ikuzo, 4,510,025, Cl. 204-78.000.

Nishioka, Kimihiko, to Olympus Optical Co., Ltd. Diopter adjustable eyepiece used for view-finders of single-lens reflex cameras or the like. 4,509,831, Cl. 350-410.000.

Nishitoba, Shigeo; and Fukaya, Hirokazu, to Nippon Electric Company, Ltd. Pulse width control circuit. 4,509,494, Cl. 123-609.000.

Nishizawa, Takeshi: *See*—
Furumura, Yuji; and Nishizawa, Takeshi, 4,510,177, Cl. 427-85.000.

Nissan Motor Company, Limited: *See*—
Hirabayashi, Yuji, 4,509,331, Cl. 60-602.000.
Ike, Masahide; and Arita, Masashi, 4,509,353, Cl. 72-267.000.
Kubota, Hitoshi, 4,509,800, Cl. 303-6.00C.
Nagumo, Shinichi; Ofuji, Hiromichi; and Miisho, Kazuyuki, 4,509,481, Cl. 123-407.000.

Nitto Electric Industrial Co., Ltd.: *See*—
Okuno, Toshimitsu; Hori, Yutaka; Sunakawa, Makoto; and Inagaki, Sadayuki, 4,510,181, Cl. 427-142.000.

NL Industries, Inc.: *See*—
Bates, H. John, 4,509,405, Cl. 91-420.000.

Noda, Kenichi: *See*—
Ybe, Minoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, 4,510,413, Cl. 313-460.000.

Nogami, Takashi; and Nawa, Masayoshi, to Kao Corporation. Electrochemical battery including a product of activated carbon fiber as an electrode. 4,510,216, Cl. 429-101.000.

Nohmi, Makoto: *See*—
Mori, Kinji; Nohmi, Makoto; Miyamoto, Shoji; Ihara, Hirokazu; Matsumaru, Hiroshi; and Ikeda, Katuaki, 4,510,492, Cl. 340-825.050.

Noiles, Douglas G.: *See*—
McGarry, Richard A.; and Noiles, Douglas G., 4,509,518, Cl. 128-325.000.

Noll, Robert W. Thermally-powered control mechanism. 4,509,678, Cl. 236-49.000.

Nomori, Hiroyuki: *See*—
Yamazaki, Toshinori; Nomori, Hiroyuki; Matsuzaki, Masatoshi; Shima, Tetsuo; and Myokan, Isao, 4,510,224, Cl. 430-57.000.

Nonaka, Zenichiro: *See*—
Kato, Yoshinori; Matsui, Makoto; and Nonaka, Zenichiro, 4,509,638, Cl. 198-486.000.

Nonnenmacher, Gerhard: *See*—
Knodel, Emil; and Nonnenmacher, Gerhard, 4,509,902, Cl. 417-216.000.

Nonogaki, Saburo: *See*—
Morishita, Hajime; Akagi, Motoo; Nonogaki, Saburo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,510,226, Cl. 430-144.000.

Norman Dryer Company, Inc.: *See*—
Coffman, Randall R.; and Mitchell, James E., 4,509,275, Cl. 34-126.000.

Northern Vibrator Manufacturing Limited: *See*—
Jack, James M.; and Mitchell, Stanley W., 4,509,701, Cl. 241-292.000.

Nossen, Edward J., to RCA Corporation. Fast correlation system. 4,510,579, Cl. 364-728.000.

Novak, Jiri: *See*—
Pajgrt, Jan; Bezdicek, Jan; and Novak, Jiri, 4,509,629, Cl. 192-0.098.

Nowak, Florian I. Force transmitting wedge structure. 4,509,765, Cl. 279-50.000.

Nozawa, Ryoichiro; Kiya, Nobuyuki; and Murakami, Kunihiko, to Fanuc Ltd. Method and apparatus for controlling feed speed in numerical control system. 4,510,427, Cl. 318-590.000.

NPO "Burevestnik": *See*—
Goganov, Dmitry A.; and Ovchinnikov, Evgeny K., 4,510,391, Cl. 250-374.000.

Nuerrenbach, Axel: *See*—
Lechtken, Peter; Nuerrenbach, Axel; and Schole, Juergen, 4,510,146, Cl. 514-312.000.

Nussbaumer, Wolfgang, to Kastle Gesellschaft m.b.H. Ski. 4,509,771, Cl. 280-609.000.

Nussdorfer, Theodore J.; and Kesseli, James B., to Sanders Associates, Inc. Brayton engine burner. 4,509,333, Cl. 60-723.000.

Obama, Kenjiro: *See*—
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Satoh, Akihiro, 4,510,292, Cl. 525-247.000.

Obara, Haruki, to Fanuc Ltd. Wire-cut electric discharge machine. 4,510,367, Cl. 219-69.00W.

Oce-Nederland B.V.: *See*—
Eertink, Bastiaan B. B., 4,510,266, Cl. 318-696.000.

Ochiai, Izumi: *See*—
Suzuki, Akio; Akiyama, Mitsuo; Uzuhashi, Hideo; Ochiai, Izumi; Yamashita, Hitoshi; Sekine, Youji; Matsui, Katsuo; and Tomita, Syuji, 4,509,354, Cl. 72-294.000.

Ochiai, Kouji; and Tomita, Hitoshi, to Diesel Kiki Co., Ltd. Diesel engine with EGR control. 4,509,492, Cl. 123-569.000.

Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, to Takeda Chemical Industries, Ltd. 7-[2-(2-Aminothiazol-4-yl)-2-(syn)-methoxyiminoacetamido]cephalosporin derivatives. 4,510,138, Cl. 514-206.000.

Ochiai, Takeji: *See*—
Yamazaki, Hisashi; and Ochiai, Takeji, 4,510,388, Cl. 250-327.200.

Ochiai, Toshihiko: *See*—
Ando, Yasuo; and Ochiai, Toshihiko, 4,510,218, Cl. 429-198.000.

Oda, Hidekuni; Minami, Syuji; Inoue, Hiroshi; Matsuda, Akira; and Yamamoto, Yohzoh, to Mitsui Petrochemical Industries, Ltd. Ethylene-alpha-olefin-polyene random copolymer rubber. 4,510,303, Cl. 526-282.000.

Odawara, Masachika, to Tokyo Shibaura Denki Kabushiki Kaisha. Turbine rotor. 4,509,900, Cl. 416-198.00A.

Odawara, Yoji: *See*—
Haga, Ryoichi; Ishida, Masahiko; and Odawara, Yoji, 4,510,243, Cl. 435-167.000.

Oden, Kenneth W., to Dixie-Narco, Inc. Anti-theft device for tandem column vendor. 4,509,658, Cl. 221-115.000.

Oellig, Oskar; Grimmer, Horst; and Lunz, Alfred-Gunther, to Diehl GmbH & Co. Program plate for a timer. 4,509,864, Cl. 368-108.000.

Ofuji, Hiromichi: *See*—
Nagumo, Shinichi; Ofuji, Hiromichi; and Miisho, Kazuyuki, 4,509,481, Cl. 123-407.000.

Ogasawara, Hiroyuki: *See*—
Bando, Niro; Kurohara, Kazuaki; Fujima, Yasuo; Ikeda, Fumihiro; Usiro, Kenzo; and Ogasawara, Hiroyuki, 4,509,614, Cl. 180-273.000.

Ogata, Yoshiro; Yamazaki, Haruo; and Akutsu, Hidezoh, to Matsushita Electronics Corporation. Fluorescent lamp and process for fabricating the same. 4,510,415, Cl. 313-493.000.

Ogawa, Hiroshi; Mizuno, Chiaki; and Tamai, Yasuo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,510,203, Cl. 428-425.900.

Ogawa, Shuji: *See—*
Yagi, Shigenori; Kuzumoto, Masaki; Tanaka, Masaaki; and Ogawa, Shuji, 4,510,606, Cl. 372-25.000.
Ogawa, Yutaka: *See—*
Hada, Takashi; Kanamaru, Tatsuya; and Ogawa, Yutaka, 4,510,209, Cl. 428-659.000.
Ogletree, Robert H.: *See—*
Powers, Frank M.; and Ogletree, Robert H., 4,509,728, Cl. 266-44.000.
Ogura, Masahiko, to Tokyo Shibaura Denki Kabushiki Kaisha. DC Motor soft-start circuit. 4,510,422, Cl. 318-254.000.
Oguro, Shinji: *See—*
Kanno, Takashi; Oka, Akira; Okamoto, Ituo; Mizushima, Kouji; and Oguro, Shinji, 4,510,552, Cl. 361-413.000.
Ohkubo, Takashi: *See—*
Okazaki, Haruo; and Ohkubo, Takashi, 4,510,274, Cl. 523-411.000.
Ohmori, Takashi: *See—*
Kurata, Masami; Inui, Toshiharu; and Ohmori, Takashi, 4,510,523, Cl. 358-75.000.
Moriguchi, Haruhiko; Moriguchi, Fujio; and Ohmori, Takashi, 4,510,506, Cl. 346-76.0PH.
Ohmura, Jukichi: *See—*
Kimoto, Kyoji; Miyauchi, Hirotsugu; Ohmura, Jukichi; Ebisawa, Mikio; and Hane, Toshioki, 4,510,328, Cl. 568-32.000.
Ohshima, Shohzo; Kusuda, Mikio; and Isoya, Toshiro, to Asahi Kasei Kogyo Kabushiki Kaisha. Coating type insoluble lead dioxide anode. 4,510,034, Cl. 204-290.00F.
Ohta, Hiroyuki; and Masumoto, Yutaka, to Pioneer Electronic Corporation. Magnetic head system for tape player. 4,510,543, Cl. 360-106.000.
Ohwaki, Takayuki: *See—*
Sakashita, Shigeru; Nakagawa, Takeshi; Ohwaki, Takayuki; and Miyake, Yasuo, 4,510,168, Cl. 427-3.000.
Oishi, Masatoshi, to Mazda Motor Company. Apparatus for forming a sheet metal product having an opening. 4,509,355, Cl. 72-325.000.
Oka, Akira: *See—*
Kanno, Takashi; Oka, Akira; Okamoto, Ituo; Mizushima, Kouji; and Oguro, Shinji, 4,510,552, Cl. 361-413.000.
Oka, Takahiro: *See—*
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Satoh, Akihiro, 4,510,292, Cl. 525-247.000.
Oka, Yutaka; Saeki, Naomi; and Fuseya, Yoshiharu, to Fuji Photo Film Co., Ltd. Lithographic photosensitive material. 4,510,229, Cl. 430-265.000.
Okada, Hiroshi, to Mitsuchi Corporation. Pantagraph type jack. 4,509,724, Cl. 254-126.000.
Okamoto, Ituo: *See—*
Kanno, Takashi; Oka, Akira; Okamoto, Ituo; Mizushima, Kouji; and Oguro, Shinji, 4,510,552, Cl. 361-413.000.
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, to Okura Kogyo Kabushiki Kaisha. Anaerobic adhesives having excellent adhesive property and preservative stability. 4,510,270, Cl. 523-176.000.
Okamoto, Tosaku; Okimoto, Tomoyuki; and Ishida, Katsuhiko, to Kanzaki Paper Manufacturing Company, Limited. Heat-sensitive record material. 4,510,512, Cl. 346-209.000.
Okamura Corporation: *See—*
Nashimoto, Junichi; and Kurokawa, Zenkichi, 4,509,893, Cl. 414-280.000.
Okazaki, Haruo; and Ohkubo, Takashi, to Denki Kagaku Kogyo Kabushiki Kaisha. Vinyl acetate-ethylene copolymer emulsion and aqueous emulsion adhesive composition containing the emulsion. 4,510,274, Cl. 523-411.000.
Okazaki, Masaki: *See—*
Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; Toya, Ichizo; and Syuto, Sadanobu, 4,510,235, Cl. 430-574.000.
OKI Electric Industry Co. Ltd.: *See—*
Onozawa, Kazuo, 4,510,497, Cl. 343-5.0EM.
Okimoto, Tomoyuki: *See—*
Okamoto, Tosaku; Okimoto, Tomoyuki; and Ishida, Katsuhiko, 4,510,512, Cl. 346-209.000.
Okino, Takaaki: *See—*
Tsujii, Tatsuo; and Okino, Takaaki, 4,510,577, Cl. 364-563.000.
Okitsu, Yoshio: *See—*
Kawaida, Shinji; Okitsu, Yoshio; and Ikeda, Kazunari, 4,510,012, Cl. 156-415.000.
Okubo, Yuji: *See—*
Maida, Osamu; Takemae, Mikio; and Okubo, Yuji, 4,509,847, Cl. 354-442.000.
Okuda, Eiji: *See—*
Yamasaki, Tetsuya; Okuda, Eiji; and Yamamoto, Noboru, 4,509,824, Cl. 350-167.000.
Okunaka, Masaaki; Mizukoshi, Katsuro; Hongo, Mikio; and Miyauchi, Tateoki, to Hitachi, Ltd. Photomask with corrected white defects. 4,510,222, Cl. 430-5.000.
Okuno, Toshimitsu; Hori, Yutaka; Sunakawa, Makoto; and Inagaki, Sadayuki, to Nitto Electric Industrial Co., Ltd. Method for coating metal surface. 4,510,181, Cl. 427-142.000.
Okura Kogyo Kabushiki Kaisha: *See—*
Okamoto, Takanori; Mori, Hisakazu; and Matsuda, Hideaki, 4,510,270, Cl. 523-176.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., to Mobil Oil Corporation. Process for dewaxing of petroleum oils prior to demetalation and desulfurization. 4,510,043, Cl. 208-97.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., to Mobil Oil Corporation. Process for hydrotreating petroleum residua and catalyst therefor. 4,510,044, Cl. 208-111.000.
Olin Corporation: *See—*
Dardis, Richard E., 4,509,597, Cl. 166-274.000.
Oliver, Larry R., to Dayco Corporation. Method of making an endless power transmission belt construction. 4,510,003, Cl. 156-137.000.
Olympus Optical Co., Ltd.: *See—*
Iba, Youich; Nakahashi, Ken-ichi; and Matsubara, Masaki, 4,509,838, Cl. 354-62.000.
Iwasawa, Teruo, 4,510,423, Cl. 318-331.000.
Kato, Kiichi; Musha, Tohru; and Ito, Kenichi, 4,509,830, Cl. 350-394.000.
Kato, Toshikazu, 4,510,540, Cl. 360-93.000.
Mizokami, Kazunori, 4,509,845, Cl. 354-420.000.
Nishioka, Kimihiko, 4,509,831, Cl. 350-410.000.
Tsukaya, Takashi, 4,509,508, Cl. 128-6.000.
Yabe, Hisao, 4,509,507, Cl. 128-4.000.
Omron Tateisi Electronics Co.: *See—*
Atsumi, Haruo; and Koizumi, Haruyuki, 4,510,355, Cl. 200-47.000.
Ono, Takuro: *See—*
Arai, Fuminao; Kodama, Hisashi; and Ono, Takuro, 4,509,467, Cl. 123-90.160.
Onozawa, Kazuo, to OKI Electric Industry Co. Ltd. Ramark beacon apparatus. 4,510,497, Cl. 343-5.0EM.
Ooe, Tsuguo: *See—*
Kobayashi, Minoru; Sakai, Yoshiya; Minato, Shoji; Ooe, Tsuguo; Arai, Katsumi; and Suga, Tetsuo, 4,510,374, Cl. 219-146.100.
Oosawa, Seiichi: *See—*
Kurihara, Toshio; Kunita, Masao; Yasunaga, Makoto; Masuda, Katuya; Moriya, Takashi; and Oosawa, Seiichi, 4,509,421, Cl. 101-93.040.
Orchard, Rolf O.: *See—*
Gagne, Roger A.; and Orchard, Rolf O., 4,509,688, Cl. 239-338.000.
Orth, Winfried: *See—*
Tonnius, Dietrich; Weiss, Wolfgang; Orth, Winfried; Miele, Heinrich; and Pastorek, Emmerich, 4,510,090, Cl. 260-396.00R.
Osaka Gas Company Limited: *See—*
Ito, Hirosato, 4,509,915, Cl. 431-215.000.
Ouchi, Yasumasa; and Otoshi, Shoji, 4,509,336, Cl. 62-112.000.
Osako, Kyoichi: *See—*
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.
Osterreichische Draukraftwerke Aktiengesellschaft: *See—*
Schrofelbauer, Herbert; Kaki, Josef; Staudinger, Gernot; and Filipot, Hermann, 4,509,436, Cl. 110-345.000.
Otaka, Masahiro: *See—*
Fujii, Kanichi; and Otaka, Masahiro, 4,510,608, Cl. 372-87.000.
Otobe, Yutaka: *See—*
Hasegawa, Shumpei; Otobe, Yutaka; Kishi, Noriyuki; and Koumura, Takashi, 4,509,489, Cl. 123-489.000.
Otoshi, Shoji: *See—*
Ouchi, Yasumasa; and Otoshi, Shoji, 4,509,336, Cl. 62-112.000.
Ott, Kevin C.: *See—*
Lewis, Robert M.; Ott, Kevin C.; and Van Santen, Rutger A., 4,510,257, Cl. 502-63.000.
Otto, Stanley W.; Rhoads, Jack G.; and Scrivan, Michel A., to Hallmark Cards, Inc. Directing and controlling the distribution of radiant energy. 4,509,825, Cl. 350-259.000.
Ouchi, Yasumasa; and Otoshi, Shoji, to Osaka Gas Company Limited. Air conditioning apparatus. 4,509,336, Cl. 62-112.000.
Oura, Kiyomori: *See—*
Kubo, Yoichiro; Kohtaki, Takaaki; and Oura, Kiyomori, 4,510,293, Cl. 525-338.000.
Outboard Marine Corporation: *See—*
Hall, Charles B., 4,509,924, Cl. 440-51.000.
Ovchinnikov, Evgeny K.: *See—*
Goganov, Dmitry A.; and Ovchinnikov, Evgeny K., 4,510,391, Cl. 250-374.000.
Overeem, Jan C.: *See—*
Albert, Alban I.; Ballenegger, Marc E.; Overeem, Jan C.; and Tyson, Robert G., 4,510,159, Cl. 514-456.000.
Owens-Corning Fiberglas Corporation: *See—*
Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased, 4,510,048, Cl. 209-3.000.
Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased, 4,510,049, Cl. 209-3.000.
Potter, Russell M., 4,510,252, Cl. 501-35.000.
Zambrano, Adolfo R., 4,509,976, Cl. 75-21.000.
Oy Wartsila Ab: *See—*
Uomala, Vilho; Karkkainen, Jouko; and Sandstrom, Kjell, 4,509,719, Cl. 251-214.000.
Ozaki, Kiyomi; and Tunoda, Kikuo, to Ryobi Ltd. Fishing line engaging and releasing mechanism in a closed-face type reel. 4,509,704, Cl. 242-84.20A.
Ozawa, Kazuo: *See—*
Asami, Shojiro; Ozawa, Kazuo; and Sawa, Tetsuo, 4,510,546, Cl. 360-133.000.
Ozeki, Sadao: *See—*
Nagamoto, Yoshihito; and Ozeki, Sadao, 4,509,790, Cl. 296-204.000.

Ozgunay, A. Aykut: *See*—
Whittenburg, Stephen L.; McCormick, David D.; Tweed, William J.; Ozgunay, A. Aykut; and Williams, James T., 4,509,412, Cl. 99-331.000.

Ozmeral, Ahmet C., to BASF Wyandotte Corporation. Foam control composition containing high foaming nonionic surfactant and a polyoxyalkylene compound. 4,510,067, Cl. 252-174.210.

Paeye, Gerard: *See*—
Wiart, Albert; and Paeye, Gerard, 4,509,337, Cl. 62-235.100.

Pajgrt, Jan; Bezdicek, Jan; and Novak, Jiri, to ZVS Vyzkumnevyvojovy Ustav, koncernova ucelova organizace. Plural motor plural clutch with worm drive. 4,509,629, Cl. 192-0.098.

Pakur, Henryk: *See*—
Funk, Heinrich; Pakur, Henryk; and Seitz, Hans, 4,509,575, Cl. 152-356.00R.

Palmer, C. Dale: *See*—
Traver, Jack L.; Palmer, C. Dale; and Hughes, Richard, 4,509,593, Cl. 166-63.000.

Palosi, Eva: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.

Pan, Wie-Hin: *See*—
Stiefel, Edward I.; Pan, Wie-Hin; and Chianelli, Russell R., 4,510,260, Cl. 502-219.000.

Panavision, Incorporated: *See*—
Gottschalk, Robert E., 4,510,529, Cl. 358-224.000.

Pancior S.A.: *See*—
Spaziante, Placido M., 4,510,026, Cl. 204-95.000.

Paolantonio, Vito J.: *See*—
Stroffolino, Leon C., 4,509,420, Cl. 101-35.000.

Papaioannou, Stamatios: *See*—
Hansen, Donald W., Jr.; and Papaioannou, Stamatios, 4,510,085, Cl. 260-112.50E.

Papeteries de Jeand'heurs: *See*—
Bartelloni, Rene , 4,510,019, Cl. 162-141.000.

Paranjpe, Suresh C.; and McJohnson, Robert B., to Mead Corporation, The. Ink jet printer control circuit and method. 4,510,503, Cl. 346-75.000.

Parcell, Lloyd J.: *See*—
Rowe, Edward H.; and Parcell, Lloyd J., 4,510,057, Cl. 210-612.000.

Parham, Fred, to Deflecta-Shield Corporation. Heat reclaimer. 4,509,588, Cl. 165-80.00R.

Parker Chemical Company: *See*—
Higgins, George L., 4,509,992, Cl. 148-6.270.

Parker, David W.; and van de Polder, Leendert J., to U.S. Philips Corporation. Television transmission system. 4,510,520, Cl. 358-12.000.

Parker, Larry J.: *See*—
Saxman, William C.; and Parker, Larry J., 4,509,607, Cl. 175-227.000.

Parks, David R.; Bryan, Virginia M.; and Herzenberg, Leonard A., to Leland Stanford Jr. University, The Board of Trustees of the. Cell labeling with antigen-coupled microspheres. 4,510,244, Cl. 435-172.200.

Parlman, Robert M.; Bresson, Clarence R.; and Young, Tommy L. Metal trithiocarbonates as depressants. 4,510,050, Cl. 209-167.000.

Parrott, Stephen L. Catalytic hydrodenitrogenation of organic compounds. 4,510,046, Cl. 208-254.00H.

Partridge, Wilfred H. Bicycle with key-operated locking mechanism. 4,509,349, Cl. 70-233.000.

Pasbrig, Max, to Lacrex Brevetti S.A. Break ignition plug. 4,509,469, Cl. 123-154.000.

Pastorek, Emmerich: *See*—
Tonnius, Dietrich; Weiss, Wolfgang; Orth, Winfried; Miele, Heinrich; and Pastorek, Emmerich, 4,510,090, Cl. 260-396.00R.

Patentverwertungs-u, Finanzierungsgesellschaft Seranta AG: *See*—
Schmid, August, 4,509,752, Cl. 273-49.000.

Patterson, David W.: *See*—
McInturff, Joe A.; and Patterson, David W., 4,509,367, Cl. 73-457.000.

Patts, Larry: *See*—
May, Francis A.; and Patts, Larry, 4,510,352, Cl. 191-64.000.

Paulson, Wayne M.; and Hughes, David W., to Motorola, Inc. Thin film resistor material and method. 4,510,178, Cl. 427-94.000.

Pawloski, Chester E.; and Ginter, Sally P., to Dow Chemical Company, The. Halogenated phosphorus hydroxy-alkyl and t-alkoxyalkyl esters. 4,510,101, Cl. 260-928.000.

Paxton, Jerre H. Dual-opening bag closure. 4,509,231, Cl. 24-30.50R.

Payne, Kenneth G., to Sasib S.p.A. Buffer storage apparatus. 4,509,634, Cl. 198-347.000.

Paz, Lirida. Disposable liner for a musical potty chair. 4,509,215, Cl. 4-452.000.

Pearce, Peter: *See*—
Pearce, Peter J., 4,509,879, Cl. 403-172.000.

Pearce, Peter J., to Pearce, Peter. Joining system for triangulated structures. 4,509,879, Cl. 403-172.000.

Pearson, Robert E. Means and method for color separation and reproduction. 4,509,854, Cl. 355-38.000.

Pease, Floyd T.; and Shelton, Joseph T., to Sonat Offshore Drilling Inc. Quick disconnect/connect mooring method and apparatus for a turret moored drillship. 4,509,448, Cl. 114-293.000.

Peck, Paul P. Animal transport and grooming device. 4,509,461, Cl. 119-103.000.

Peden, Richard A.: *See*—
Ament, Frank; Peden, Richard A.; and Ausen, John E., 4,509,478, Cl. 123-339.000.

Pedersen, Eigil: *See*—
Sokoler, Henryk; and Pedersen, Eigil, 4,509,306, Cl. 52-302.000.

Peet, William G.; and Tebbe, Frederick N., to Du Pont de Nemours, E. I., and Company. Process for making alkali-metal tetraorganylborates. 4,510,327, Cl. 568-1.000.

Peisach, Joel M.: *See*—
Sell, William J.; Peisach, Joel M.; and Riege, David H., 4,510,393, Cl. 250-475.200.

Pelaez, Joaquin: *See*—
Staley, Lorie L.; and Pelaez, Joaquin, 4,510,164, Cl. 426-331.000.

Pelt & Hooykaas B.V.: *See*—
Hooykaas, Carel W. J., 4,509,986, Cl. 106-110.000.

Pereira, Carmo J.; Hegedus, Louis; and Maselli, James M., to W. R. Grace & Co. Catalyst with high geometric surface area. 4,510,261, Cl. 502-304.000.

Pereira, Carmo J.; and Hegedus, Louis, to W. R. Grace & Co. Catalyst with high geometric surface area alumina extrudate and catalyst with high geometric surface area. 4,510,263, Cl. 502-314.000.

Pereira, Carmo J.: *See*—
Kim, Gwan; Pereira, Carmo J.; Hegedus, Louis; and Maselli, James M., 4,510,262, Cl. 502-304.000.

Peries, Jean-Pierre: *See*—
Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve , 4,510,042, Cl. 208-59.000.

Perkin-Elmer Corporation, The: *See*—
Mount, Bruce E., 4,509,372, Cl. 73-861.280.

Perrella, Blaine: *See*—
Dreiling, Ronald; and Perrella, Blaine, 4,509,281, Cl. 42-1.00Y.

Persico, Daniel F.: *See*—
Lagow, Richard J.; and Persico, Daniel F., 4,510,335, Cl. 568-683.000.

Perulfi, John R.: *See*—
Rostron, Joseph R.; and Perulfi, John R., 4,510,477, Cl. 336-92.000.

Pesa, Frederick A.; and Graham, Anne M., to Standard Oil Co. (Ohio), The. Preparation of aliphatic carboxylic acid esters. 4,510,320, Cl. 560-265.000.

Pestcon Systems, Inc.: *See*—
Heiman, Gerald R.; and Fleck, Frank, 4,509,682, Cl. 239-60.000.

Pete, Sandor: *See*—
Boday, Otto ; Herpay, Andras; Krajcsovics, Ferenc; Neveri, Istvan; Pete, Sandor; Pocsy, Ferenc; Szikora, Bela; and Szirmai, Endre, 4,509,434, Cl. 110-238.000.

Peters, Dierk D. Apparatus for forming I-beam truss structure. 4,509,571, Cl. 144-2.00R.

Peters, Donald L.; Rathman, John R.; and Sumpter, Irvin L., to Phillips Petroleum Company. Apparatus and method for blow molding. 4,510,116, Cl. 264-529.000.

Peters, Edward N.: *See*—
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., 4,510,289, Cl. 525-148.000.

Peters, Raymond A. Flashlight-screwdriver combination. 4,510,561, Cl. 362-399.000.

Petersen, Paul S., to MTS Systems Corporation. Column clamping assembly. 4,509,910, Cl. 425-451.900.

Petersen, Walter E., to H. D. Hudson Manufacturing Company. Portable sprayer with safety cover. 4,509,664, Cl. 222-402.000.

Peterson, Lauren M., to Environmental Research Institute of Michigan, The. Amplitude modulator for a high powered beam of infrared radiation. 4,509,829, Cl. 350-358.000.

Peterson, Linn A.: *See*—
Dick, Melvin E.; and Peterson, Linn A., 4,509,781, Cl. 293-104.000.

Petroleum Meter & Pump Co., Inc.: *See*—
Hockmuth, Richard L., 4,509,390, Cl. 74-705.000.

Petrophysical Services, Inc.: *See*—
MacAskill, Christopher R.; and Potter, Jared M., 4,509,904, Cl. 417-568.000.

Pettovello, Elzi: *See*—
Cox, Ron; and Pettovello, Elzi, 4,510,373, Cl. 219-137.710.

Pevsner, Paul H. Method of using miniature balloon catheter for perfusing. 4,509,523, Cl. 128-658.000.

Pfizer Inc.: *See*—
LaMattina, John L.; and Lipinski, Christopher A., 4,510,313, Cl. 548-194.000.
Richardson, Kenneth; and Cooper, Kelvin, 4,510,148, Cl. 514-340.000.
Welch, Willard M., Jr., 4,510,308, Cl. 546-85.000.

Pflaum, August; and Mayer, Albert, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Multiple paper web guiding and combining apparatus for combination with rotary printing machine and folding device. 4,509,733, Cl. 270-41.000.

Pflugbeil, Wolf-Dietrich; and Kramer, Wolfgang, to Bayer Aktiengesellschaft. Preparation of 1-azolyl-3,3-dimethyl-1-phenoxybutan-2-ols. 4,510,314, Cl. 548-262.000.

Pharmindev Limited: *See*—
Cosentino, Roberto F.; and Bonapace, Franco, 4,510,170, Cl. 427-33.000.

Phelps, Colin J.: *See*—
Carroll, Noel; and Phelps, Colin J., 4,510,405, Cl. 310-76.000.

Philip Morris Incorporated: *See*—
Houminer, Yoram; and Podraza, Kenneth F., 4,509,537, Cl. 131-276.000.

Phillips, Edwin D. Separatory funnel and valve device. 4,509,566, Cl. 141-94.000.

Phillips, John R.; Halbig, James K.; Menlove, Howard O.; and Klosterbuer, Shirley F., to United States of America, Energy. Apparatus for in situ determination of burnup, cooling time and fissile content of an irradiated nuclear fuel assembly in a fuel storage pond. 4,510,117, Cl. 376-257.000.

Phillips Petroleum Company: *See—*
Cobb, Raymond L., 4,510,337, Cl. 568-734.000.
Peters, Donald L.; Rathman, John R.; and Sumpter, Irvin L., 4,510,116, Cl. 264-529.000.
Svetlik, Harvey E., 4,509,590, Cl. 165-104.270.

Picard, Claude: *See—*
Mercey, Gilles; Picard, Claude; and Saint-Martin, Bernard, 4,509,505, Cl. 128-1.00B.

Pickett, Bobby L. Pet hitching device. 4,509,462, Cl. 119-117.000.

Pico-Glass S.p.A.: *See—*
Astolfi, Pietro, 4,509,278, Cl. 40-156.000.

Pierantozzi, Ronald, to Air Products and Chemicals, Inc. Preparation of olefins from synthesis gas using ruthenium supported on ceric oxide. 4,510,267, Cl. 518-715.000.

Pierre Fabre S.A.: *See—*
Cousse, Henry; Mouzin, Gilbert; Tarayre, Jean-Pierre; and Rieu, Jean-Pierre, 4,510,142, Cl. 514-255.000.

Pillan, Antonio: *See—*
Cozzi, Paolo; Carganico, Germano; Pillan, Antonio; and Branzoli, Umberto, 4,510,149, Cl. 514-341.000.

Pioneer Electronic Corporation: *See—*
Ishida, Kohji; and Sakamoto, Masaharu, 4,510,452, Cl. 328-144.000.
Ohta, Hiroyuki; and Masumoto, Yutaka, 4,510,543, Cl. 360-106.000.
Sato, Tetsuo; Kominami, Yasuo; Takizawa, Yoshiyuki; and Haeno, Akira, 4,510,458, Cl. 330-260.000.

Pirrallo, Frank G., to General Motors Corporation. Apparatus for fluidizing a particulate bed within a flask. 4,509,579, Cl. 164-159.000.

Pitney Bowes Inc.: *See—*
Erwin, Timothy R., 4,509,780, Cl. 292-307.00R.

Pitt, Derek C.: *See—*
Emsley, Robert M.; and Pitt, Derek C., 4,509,635, Cl. 198-365.000.

Platt, Herbert; and Stracher, Alfred, to Genetic Diagnostics Corporation. Promoting animal and plant growth with leupeptin. 4,510,130, Cl. 514-2.000.

Plattner, Eric; Staubli, Sebastian; and von Kaenel, Fred, to Ciba Geigy Ag. Process for the production of 2-amino-1-naphthalenesulfonic acid. 4,510,100, Cl. 260-508.000.

Plumail, Jean-Claude: *See—*
Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, 4,510,255, Cl. 502-10.000.

Pneumo Corporation: *See—*
Vanderlaan, Robert D.; and Grau, Richard, 4,510,403, Cl. 310-36.000.

Pocsy, Ferenc: *See—*
Boday, Otto ; Herpay, Andras; Krajcsovics, Ferenc; Neveri, Istvan; Pete, Sandor; Pocsy, Ferenc; Szikora, Bela; and Szirmai, Endre, 4,509,434, Cl. 110-238.000.

Podraza, Kenneth F.: *See—*
Houminer, Yoram; and Podraza, Kenneth F., 4,509,537, Cl. 131-276.000.

Pohl, Ludwig: *See—*
Eidenschink, Rudolf; Haas, Gunther; Pohl, Ludwig; Romer, Michael; Scheuble, Bernhard; and Weber, Georg, 4,510,069, Cl. 252-299.610.

Polaroid Corporation: *See—*
Gerber, Arthur M., 4,510,232, Cl. 430-494.000.
Johnson, Bruce K.; and Whiteside, George D., 4,509,840, Cl. 354-400.000.
Taylor, Lloyd D., 4,510,294, Cl. 525-369.000.

Pollock, Stephen F., to Wayne H. Coloney Company, Inc. Portable ammunition handling and loading system. 4,509,401, Cl. 86-48.000.

Pope, George A.: *See—*
Cheetham, Ivan C.; and Pope, George A., 4,509,559, Cl. 138-121.000.

Popek, Marc H.: *See—*
Rice, Craig W.; and Popek, Marc H., 4,510,465, Cl. 332-16.00T.

Post Office, The: *See—*
Emsley, Robert M.; and Pitt, Derek C., 4,509,635, Cl. 198-365.000.

Potter, Jared M.: *See—*
MacAskill, Christopher R.; and Potter, Jared M., 4,509,904, Cl. 417-568.000.

Potter, Russell M., to Owens-Corning Fiberglas Corporation. Easily formed chemically resistant glass fibers. 4,510,252, Cl. 501-35.000.

Poulson, Ann: *See—*
Buchheister, Sue; and Poulson, Ann, 4,509,921, Cl. 434-253.000.

Power Piping Company: *See—*
Litz, Milton B., 4,509,561, Cl. 138-149.000.

Powers, Frank M.; and Ogletree, Robert H., to Southwire Company. Molten metal filtration indicator. 4,509,728, Cl. 266-44.000.

PPG Industries, Inc.: *See—*
Reese, Walter J., 4,509,702, Cl. 242-18.00G.

Prato, Francesco, to Ing. C. Olivetti & C., S.p.A. Display device for photocopiers. 4,510,491, Cl. 340-792.000.

Pratt, John H., Jr.: *See—*
Brennan, Edward J.; and Pratt, John H., Jr., 4,509,795, Cl. 297-434.000.

Pratt & Whitney Canada Inc.: *See—*
Breitman, Daniel S.; and Langenegger, Henrique, 4,509,962, Cl. 55-306.000.

Precision Steel Warehouse, Inc.: *See—*
Lipscomb, Robert J., 4,509,891, Cl. 414-113.000.

Priefert Mfg. Co., Inc.: *See—*
Priefert, Marvin J., 4,509,577, Cl. 160-328.000.

Priefert, Marvin J., to Priefert Mfg. Co., Inc. Chain gate structure. 4,509,577, Cl. 160-328.000.

Prikryl, Ivan. Hologram synthesis. 4,509,818, Cl. 350-3.760.

Prime Computer, Inc.: *See—*
Cohen, Paul B., 4,510,581, Cl. 364-900.000.

Prindle, William A., to Corning Glass Works. Versatile knife holder. 4,509,651, Cl. 211-70.600.

Printal Oy: *See—*
Makilaakso, Antero, 4,509,660, Cl. 222-107.000.

Priscu, John C.: *See—*
Neelameggham, Ramaswami; Priscu, John C.; and Toomey, Robert D., 4,510,029, Cl. 204-130.000.

Pritchard, Dalton H.; and Sauer, Donald J., to RCA Corporation. CCD Comb filter employing floating gate subtractor techniques. 4,510,522, Cl. 358-31.000.

Procter & Gamble Company, The: *See—*
Mullane, William I., Jr., 4,509,908, Cl. 425-290.000.

Proebsting, Robert J.: *See—*
Dias, Donald R.; Guterman, Daniel C.; Proebsting, Robert J.; and Leuschner, Horst, 4,510,584, Cl. 365-203.000.

Prosnitz, Donald; and Haas, Roger A., to United States of America, Energy. Two-dimensional optimization of free electron laser designs. 4,510,455, Cl. 330-4.300.

Proulx, Richard W.: *See—*
Davich, Luke J.; Erickson, Jack A.; and Proulx, Richard W., 4,509,428, Cl. 102-466.000.

Pruckmayr, Gerfried, to Du Pont de Nemours, E. I., and Company. Method for preparing poly(tetramethylene ether) glycol having narrow molecular weight distribution. 4,510,333, Cl. 568-617.000.

Pryor, James W., to R. J. Reynolds Tobacco Company. Application of liquid additives to cigarette filter tow. 4,509,452, Cl. 118-234.000.

PTC Aerospace Inc.: *See—*
Brennan, Edward J.; and Pratt, John H., Jr., 4,509,795, Cl. 297-434.000.

Pullukat, Thomas J.: *See—*
Lynch, Michael W.; and Pullukat, Thomas J., 4,510,299, Cl. 526-129.000.

Pulp and Paper Research Institute of Canada: *See—*
Green, Harold V.; Fox, Thomas J.; and Scallan, Anthony M., 4,510,020, Cl. 162-169.000.

Puritan-Bennett Corporation: *See—*
Gagne, Roger A.; and Orchard, Rolf O., 4,509,688, Cl. 239-338.000.

Puyhaubert, Jean: *See—*
Resneau, Jean C.; Puyhaubert, Jean; Da Silva, Evelyne; and Lamontagne, Claude, 4,510,470, Cl. 333-142.000.

Pyrament Inc.: *See—*
Davidovits, Joseph; and Sawyer, James L., 4,509,985, Cl. 106-84.000.

Quan, Stella S. M.: *See—*
Miller, Steven P.; and Quan, Stella S. M., 4,510,239, Cl. 435-7.000.

Quandt, Earl R.: *See—*
Urbach, Herman B.; and Quandt, Earl R., 4,509,324, Cl. 60-39.170.

Quaresima, Emma: *See—*
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and de Witt, Paolo, 4,510,318, Cl. 560-147.000.

Queen's University at Kingston: *See—*
Wolfe, Saul; Westlake, Donald; and Jensen, Susan, 4,510,246, Cl. 435-183.000.

Quin, Terrence T.: *See—*
Costello, Peter E.; Fossett, Lawrence D.; Lane, Michael S.; Quin, Terrence T.; and Smith, Nicholas K., 4,510,351, Cl. 179-27.00D.

R. J. Reynolds Tobacco Company: *See—*
Pryor, James W., 4,509,452, Cl. 118-234.000.

Raab, Guenter: *See—*
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,510,068, Cl. 252-186.290.

Rabewerk Heinrich Clausing: *See—*
Akyol, Atilla, 4,510,183, Cl. 427-185.000.

Rabizzoni, Jacques: *See—*
Rolin, Guy; and Rabizzoni, Jacques, 4,509,351, Cl. 72-19.000.

Rader, Robert R.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,509,581, Cl. 164-479.000.

Radomski, James V.: *See—*
MacArthur, J. Ward; and Radomski, James V., 4,510,576, Cl. 364-551.000.

Radtke, Norman H.: *See—*
Eberline, William C.; Radtke, Norman H.; and Van Camp, Robert L., 4,509,471, Cl. 123-179.00G.

Rajchman, Jan. Electronic method and apparatus for distance measurement through the use of equidistant thermal fiducial markings. 4,510,390, Cl. 250-341.000.

Ramik, Vincent L. Hair streaking implement. 4,509,538, Cl. 132-9.000.

Ramisa Navarro, Josep. Apparatus for dispersing atomized liquid. 4,509,683, Cl. 239-77.000.

Ranco Incorporated: *See—*
Rossi, Guglielmo; and Gemma, Mario, 4,510,480, Cl. 337-321.000.

Randle, Ronald E.; and Milbright, Arnold M., to International Telephone and Telegraph Corp. Overload protector for guyed structures. 4,509,303, Cl. 52-98.000.

Rasmussen, Aaron P. Radial belt grinder. 4,509,296, Cl. 51-148.000.

Raspor, O. Carl: *See*—
Cleereman, Kenneth J.; Raspor, O. Carl; and Burmester, Alan F., 4,510,108, Cl. 264-119.000.

Ratheiser, Heinz, to American Maplan Corporation. Extrusion head for tubular bodies and hollow profiles. 4,509,907, Cl. 425-197.000.

Rathman, John R.: *See*—
Peters, Donald L.; Rathman, John R.; and Sumpter, Irvin L., 4,510,116, Cl. 264-529.000.

Raths, Gunther, to Apparatebau Rothemuhle Brandt & Kritzler Gesellschaft mit beschrankter Haftung. Apparatus for regenerative flue gas heat exchanger. 4,509,583, Cl. 165-4.000.

Rau, Willy; and Taus, Christian, to Maschinenwerk Rau GmbH. Combination implement for agricultural cultivation. 4,509,438, Cl. 111-13.000.

Ray, Asit K., to International Business Machines Corporation. Technique for thin insulator growth. 4,510,172, Cl. 427-38.000.

Ray-Chaudhuri, Dilip K.: *See*—
Rossi, Robert D.; and Ray-Chaudhuri, Dilip K., 4,510,324, Cl. 564-82.000.

Raycon Corporation: *See*—
MacGregor, John R.; Rupert, Gary F.; and Kennedy, Thomas M., 4,510,365, Cl. 219-69.00G.

Raymond, Leonard S., to Southwest Medical Products, Incorporated. Dielectric measuring systems. 4,510,436, Cl. 324-61.00P.

Raytheon Company: *See*—
Galani, Zvi; and Waterman, Raymond C., Jr., 4,510,463, Cl. 331-15.000.

RCA Corporation: *See*—
Bowman, David F., 4,510,469, Cl. 333-21.00R.
den Hollander, Willem, 4,510,527, Cl. 358-158.000.
Nossen, Edward J., 4,510,579, Cl. 364-728.000.
Pritchard, Dalton H.; and Sauer, Donald J., 4,510,522, Cl. 358-31.000.
Seer, Harold G., Jr., 4,510,564, Cl. 363-23.000.
Weaver, Charles A.; and Stephens, Joseph W., 4,510,104, Cl. 264-40.700.
Woodward, Oakley M., Jr.; and Greaves, Milton P., Jr., 4,510,501, Cl. 343-742.000.

Recordati S.A.: *See*—
Nardi, Dante; Catto, Alberto; Tajana, Alberto; Cazzulani, Pietro; and Graziani, Gabriele, 4,510,140, Cl. 544-360.000.

Redeker, Werner; and Uhlig, Uwe, to Hauni-Werke Korber & Co. KG. Apparatus for manipulating workpieces having plane parallel surfaces. 4,509,892, Cl. 414-223.000.

Redikultsev, Jury V.; and Litvinenko, Leonid A. Apparatus for chemical froth suppression in a fermenter. 4,510,249, Cl. 435-289.000.

Reece, John M.; Martin, Robert G.; and Franzel, John R., to Data I/O Corporation. Signature analysis system for testing digital circuits. 4,510,572, Cl. 364-489.000.

Reed Industries, Inc.: *See*—
Chow, Edmund E., 4,509,633, Cl. 194-100.00A.

Reese, Walter J., to PPG Industries, Inc. Apparatus for packaging a plurality of fibers or strands. 4,509,702, Cl. 242-18.00G.

Reeves, Jerry L., to Towmotor Corporation. Pump arrangement for a linear fluid operated device. 4,509,409, Cl. 92-80.000.

Regie Nationale des Usines Renault: *See*—
Lamy, Jean-Michel; and Boutant, Jean-Jacques, 4,509,384, Cl. 74-473.00R.

Registration Control Systems: *See*—
Bolton, Edgar A., 4,509,277, Cl. 40-1.500.

Reimpell, Uwe; and Stenzel, Otto, to Leybold Heraeus GmbH. Sliding contact arrangement for transmitting heavy currents from and to bus bars with slide surfaces. 4,509,807, Cl. 339-9.00R.

Remmler, A. Kathe, heir: *See*—
Remmler, Andreas, deceased; Remmler, Heinz, heir; and Remmler, A. Kathe, heir, 4,509,754, Cl. 273-142.00J.

Remmler, Andreas, deceased; by Remmler, Heinz, heir; and by Remmler, A. Kathe, heir. Electric game apparatus with rotating marker. 4,509,754, Cl. 273-142.00J.

Remmler, Heinz, heir: *See*—
Remmler, Andreas, deceased; Remmler, Heinz, heir; and Remmler, A. Kathe, heir, 4,509,754, Cl. 273-142.00J.

Renaudin, Yves: *See*—
Delpit, Philippe; Duplessis, Philippe; and Renaudin, Yves, 4,510,601, Cl. 370-110.300.

Renault Vehicules Industriels: *See*—
Morin, Rene', 4,509,490, Cl. 123-502.000.

REPA Feinstanzwerk GmbH: *See*—
Fohl, Artur, 4,509,708, Cl. 242-107.700.

Research Corporation: *See*—
Teng, Lin-nar L., 4,510,135, Cl. 514-56.000.

Resneau, Jean C.; Puyhaubert, Jean; Da Silva, Evelyne; and Lamontagne, Claude, to Thomson CSF. Electro-acoustic delay line operating in transmission. 4,510,470, Cl. 333-142.000.

Rest, Heinz: *See*—
Ufrecht, Martin; and Rest, Heinz, 4,509,293, Cl. 49-502.000.

Retech, Inc.: *See*—
Schlienger, Max P.; and Szeto, Whalun, 4,510,368, Cl. 219-69.00M.

Revlon, Inc.: *See*—
Kabacoff, Bernard L.; and Govil, Alok K., 4,510,250, Cl. 436-63.000.

Reynolds, Carl D., Jr., to United States of America, Energy. Kiln for hot-pressing compacts in a continuous manner. 4,510,363, Cl. 219-10.710.

Reynolds, James C.: *See*—
Crouse, Dennis N.; Reynolds, James C.; and Walsh, Fraser M., 4,510,214, Cl. 429-43.000.

Rheaume, Walter A., to Textile Products, Incorporated. Shaped structures of graphite fabrics, and the like, and deep drawn molded products therefrom. 4,510,198, Cl. 428-246.000.

Rhee, Yong S. Golf bag with a reinforcing insert tube. 4,509,643, Cl. 206-315.800.

Rhoads, Jack G.: *See*—
Otto, Stanley W.; Rhoads, Jack G.; and Scrivan, Michel A., 4,509,825, Cl. 350-259.000.

Rhone-Poulenc Sante: *See*—
Bluthe, Norbert; Gore, Jacques; and Malacria, Max, 4,510,330, Cl. 568-403.000.

Rhoton, Albert L., to Morgan Flotation Systems. Drain pipes for emptying waveless waterbed mattresses. 4,509,218, Cl. 5-450.000.

Rice, Craig W.; and Popek, Marc H., to Motorola, Inc. Linear gain voltage controlled oscillator with modulation compensation. 4,510,465, Cl. 332-16.00T.

Rice, Lawrence M.: *See*—
Meade, Steven L.; Morris, Merle E.; and Rice, Lawrence M., 4,510,416, Cl. 313-579.000.
Morris, Merle E.; Meade, Steven L.; and Rice, Lawrence M., 4,509,928, Cl. 445-27.000.

Richardson, Gunnar D.: *See*—
Smythe, Robert A.; Bunkenburg, Joachim; and Richardson, Gunnar D., 4,509,858, Cl. 356-358.000.

Richardson, Kenneth; and Cooper, Kelvin, to Pfizer Inc. 2-Heterocyclic-1,3-bis(1H-1,2,4-triazol-1-yl)-propan-2-ols as antifungal agents. 4,510,148, Cl. 514-340.000.

Richmond, James W., to Stryker Corporation. Ligament tunneling instrument. 4,509,516, Cl. 128-303.00R.

Richter Gedeon Vegyeszeti Gyar Rt.: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.

Richter, Peter: *See*—
Bar, Vilmos; Boszormenyi, Jozsef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,510,147, Cl. 514-314.000.

Rickrode, James A.: *See*—
Locati, Ronald P.; and Rickrode, James A., 4,509,258, Cl. 29-876.000.

Ricoh Company, Ltd.: *See*—
Horike, Masanori; Furukawa, Tatsuya; Sekiya, Takuro; Ebi, Yutaka; Isayama, Takuro; and Tachiki, Masaaki, 4,510,509, Cl. 346-140.00R.
Kanno, Tadaaki; Ukai, Takeshi; Akahoshi, Yutaka; and Shibata, Katsuji, 4,509,732, Cl. 270-37.000.

Riedl, Hermann, to Siemens Aktiengesellschaft. Device for generating images of an examination subject. 4,510,448, Cl. 324-309.000.

Riege, David H.: *See*—
Sell, William J.; Peisach, Joel M.; and Riege, David H., 4,510,393, Cl. 250-475.200.

Riemann, Hanns-Helmut; Sonnenschein, Hans; and Skaletz, Heinz, to Mannesmann Veba Umweltechnik GmbH. Rotary drum screen for waste material and its method of operation. 4,509,697, Cl. 241-72.000.

Riess, Kurt: *See*—
Mohr, Dieter; and Riess, Kurt, 4,510,227, Cl. 430-175.000.

Rieter Machine Works Limited: *See*—
Briner, Emil; and Hieronymi, Richard, 4,509,322, Cl. 57-333.000.
Wuermli, Arthur, 4,509,230, Cl. 19-245.000.

Rieu, Jean-Pierre: *See*—
Cousse, Henry; Mouzin, Gilbert; Tarayre, Jean-Pierre; and Rieu, Jean-Pierre, 4,510,142, Cl. 514-255.000.

Rijkeboer, Rudolf C., to Robert Bosch GmbH. Apparatus for air-injection of liquid gas. 4,509,479, Cl. 123-525.000.

Rines, Robert H.; and Knowles, Albert H., to K. R. Associates, Inc. Process of sea-ranching salmon and the like. 4,509,458, Cl. 119-3.000.

Rines, Robert H.: *See*—
Knowles, Albert H.; and Rines, Robert H., 4,509,459, Cl. 119-3.000.

Riordan, Edward D.: *See*—
Szantho, Charles F.; and Riordan, Edward D., 4,510,370, Cl. 219-86.250.

Rittal-Werk Rudolf Loh GmbH & Co. KG: *See*—
Erlam, David P.; and Carr, Arthur E., 4,509,810, Cl. 339-17.00M.

Rittsmannsberger, Norbert: *See*—
Junginger, Erich; Rittsmannsberger, Norbert; and Schnaibel, Eberhard, 4,509,628, Cl. 192-0.094.

Rival Manufacturing Company: *See*—
Whittenburg, Stephen L.; McCormick, David D.; Tweed, William J.; Ozgunay, A. Aykut; and Williams, James T., 4,509,412, Cl. 99-331.000.

Robert Bosch GmbH: *See*—
Betz, Dieter; and Issler, Jorg, 4,509,495, Cl. 123-643.000.
Breuser, Erich; Grozinger, Wilhelm; Latsch, Reinhard; and Wurfel, Gernot, 4,509,476, Cl. 123-266.000.
Junginger, Erich; Rittsmannsberger, Norbert; and Schnaibel, Eberhard, 4,509,628, Cl. 192-0.094.
Knodel, Emil; and Nonnenmacher, Gerhard, 4,509,902, Cl. 417-216.000.
Kubach, Hans, 4,509,715, Cl. 251-138.000.
Kull, Hermann; Wessel, Wolf; and Stumpp, Gerhard, 4,509,480, Cl. 123-359.000.
Rijkeboer, Rudolf C., 4,509,479, Cl. 123-525.000.
Romes, Roman; Schilling, Wolfgang; and Werner, Jurgen, 4,510,474, Cl. 336-30.000.

Roth, Rolf, 4,510,439, Cl. 324-73.0AT.
Schaal, Gunter; and Schramm, Heribert, 4,509,731, Cl. 269-78.000.
Robert, Jacques: *See*—
Clerc, Jean F.; and Robert, Jacques, 4,509,828, Cl. 350-333.000.
Robinson, Philip I. Tennis net tie down and height measurement device. 4,509,749, Cl. 273-29.0BA.
Robson, Michael J., to Imperial Chemical Industries PLC. Insecticidal product and preparation thereof. 4,510,160, Cl. 514-521.000.
Rocca, Jorge J.: *See*—
Collins, George J.; Thompson, Lance R.; Rocca, Jorge J.; and Boyer, Paul K., 4,509,451, Cl. 118-50.100.
Roche, William J.: *See*—
Anderson, John W., Jr.; and Roche, William J., 4,510,418, Cl. 315-73.000.
Rockwell International Corporation: *See*—
Jovick, Raymond J.; Malott, Roger J.; and Evans, Thomas E., 4,510,408, Cl. 310-168.000.
Ladouceur, Lawrence C., 4,509,256, Cl. 29-802.000.
Liggett, John V., 4,509,239, Cl. 29-159.00A.
Weisert, Edward D., 4,509,671, Cl. 228-157.000.
Rogers, Terrence E.: *See*—
Bonneau, Paul; Holshouser, Howard E.; and Rogers, Terrence E., 4,510,623, Cl. 455-181.000.
Rogister, Carl, to Goodyear Tire & Rubber Company, The. Apparatus and method for making metallic cord. 4,509,317, Cl. 57-58.320.
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, to Benckiser-Knapsack GmbH. N-(hydroxy methyl)-1-amino alkane-1,1-diphosphonic acids as stabilizing agents in peroxide-containing bleaching baths. 4,510,068, Cl. 252-186.290.
Rohrer, Gene D., to International Business Machines Corporation. Magnetic character reader with double document detection. 4,510,615, Cl. 382-7.000.
Roisen, David. Combine grain dryer and drying attachment. 4,509,273, Cl. 34-86.000.
Roland, Billy F. Planar member joint. 4,509,794, Cl. 297-440.000.
Rolfe, Keith O. Loading and unloading apparatus for a vehicle. 4,509,894, Cl. 414-555.000.
Rolin, Guy; and Rabizzoni, Jacques, to Etablissements Rondolotti. Spinning lathe. 4,509,351, Cl. 72-19.000.
Roling, Franz, to Gewerkschaft Eisenhutte Westfalia. Apparatus for controlling the position of a mineral mining machine. 4,509,799, Cl. 299-42.000.
Romanauskas, William A., to Du Pont de Nemours, E. I., and Company. Fixed angle pelleting rotor configured to provide a maximum clearing rate factor. 4,509,940, Cl. 494-16.000.
Romanchuk, Ronald N.: *See*—
Sabatino, Anthony; Stanefski, Eugene F.; Romanchuk, Ronald N.; and Schaumburg, Edward G., 4,509,252, Cl. 29-623.100.
Romell, Gunnar V. R.: *See*—
Skogberg, Bo T.; and Romell, Gunnar V. R., 4,509,889, Cl. 411-19.000.
Romer, Michael: *See*—
Eidenschink, Rudolf; Haas, Gunther; Pohl, Ludwig; Romer, Michael; Scheuble, Bernhard; and Weber, Georg, 4,510,069, Cl. 252-299.610.
Romes, Roman; Schilling, Wolfgang; and Werner, Jurgen, to Robert Bosch GmbH. Inductive pickup for fluid control element. 4,510,474, Cl. 336-30.000.
Ronconi, Mario; and Civitani, Renzo. Temperature indicating device for a cooking pot and device-pot combination. 4,509,868, Cl. 374-141.000.
Roppelt, Gunter: *See*—
Haussel, Werner; Roppelt, Gunter; and Kindermann, Robert, 4,510,444, Cl. 324-121.00R.
Rose-Plastic GmbH: *See*—
Rosler, Peter, 4,509,656, Cl. 220-8.000.
Rosen, Bruce I., to UOP Inc. Continuous reduction of edible oils. 4,510,091, Cl. 260-409.000.
Rosen, Bruce I., to UOP Inc. Continuous reduction of edible oils. 4,510,092, Cl. 260-409.000.
Rosenbaum, Larry A., to Hancor, Inc. Coupling structure and method and apparatus for its manufacture. 4,509,911, Cl. 425-532.000.
Roser, Erich: *See*—
Kuhn, Falk, 4,509,618, Cl. 184-6.400.
Rosler, Peter, to Rose-Plastic GmbH. Variable length packing container assembly. 4,509,656, Cl. 220-8.000.
Ross, Barry C.; Johnson, Graham; and Yeomans, Michael A., to Hoechst Aktiengesellschaft. 2(4-Allylthioazetidin-2-on-1-yl)acetic acid ester compounds. 4,510,086, Cl. 260-239.00A.
Ross, Gerald F., to Sperry Corporation. Baseband radar docking system. 4,510,496, Cl. 343-5.0BD.
Ross Operating Valve Company: *See*—
Scanlon, James E., 4,509,556, Cl. 137-884.000.
Rossi, Guglielmo; and Gemma, Mario, to Ranco Incorporated. Thermostat with temperature pull-down facility. 4,510,480, Cl. 337-321.000.
Rossi, Robert D.; and Ray-Chaudhuri, Dilip K., to National Starch and Chemical Corp. Monomeric disulfonimides. 4,510,324, Cl. 564-82.000.
Rosso Industrie S.p.A.: *See*—
Rosso, Pietro, 4,509,666, Cl. 223-39.000.
Rosso, Pietro, to Rosso Industrie S.p.A. Stocking turning device. 4,509,666, Cl. 223-39.000.
Rostron, Joseph R.; and Perulfi, John R., to Westinghouse Electric Corp. Current transformer. 4,510,477, Cl. 336-92.000.
Roth, Rolf, to Robert Bosch GmbH. Digital circuit multi-test system with automatic setting of test pulse levels. 4,510,439, Cl. 324-73.0AT.
Roussel Uclaf: *See*—
Westwood, Robert; Miller, Peter; Ager, Ian R.; and Kay, David P., 4,510,143, Cl. 514-250.000.
Rowe, Edward H.; and Parcell, Lloyd J., to Texaco Inc. Rotating disk biotreatment of syngas waste water. 4,510,057, Cl. 210-612.000.
Rowe, Irwin. Method for conditioning phonograph records. 4,510,187, Cl. 427-429.000.
Rowell, Frank J. Containers of flexible material. 4,509,642, Cl. 206-219.000.
Rowles, Howard C.: *See*—
Bennett, Douglas L.; Edwards, Thomas J.; and Rowles, Howard C., 4,510,023, Cl. 203-99.000.
Rowlette, John J., to California Institute of Technology. Battery plate containing filler with conductive coating. 4,510,219, Cl. 429-212.000.
Rozsnyai, Tamas: *See*—
Bar, Vilmos; Boszormenyi, Jozsef; Richter, Peter; Mercz, Jeno; and Rozsnyai, Tamas, 4,510,147, Cl. 514-314.000.
Rudich, George, Jr., to Johnson Service Company. Multi-purpose compressor controller. 4,510,547, Cl. 361-22.000.
Ruggeri, Cinzia. Textile material of a dark fabric, leather or hide with layer of microencapsulated liquid crystals. 4,510,188, Cl. 428-1.000.
Ruhrchemie Aktiengesellschaft: *See*—
Cornils, Boy; Tihanyi, Bela; Weber, Jurgen; DeWin, Werner; Erben, Edwin; and Muhlratzer, August, 4,510,182, Cl. 427-162.000.
Ruhrgas AG: *See*—
Lorenz, Werner; Bathke, Heinz; and Sommers, Hans, 4,509,913, Cl. 431-90.000.
Ruitberg, Arthur P.: *See*—
Clatterbuck, Carroll H.; and Ruitberg, Arthur P., 4,510,476, Cl. 336-84.00C.
Rundquist, Lars-Goran: *See*—
Frykhult, Rune H.; and Rundquist, Lars-Goran, 4,510,056, Cl. 210-512.100.
Runyan, I. V.: *See*—
Kuehnle, Manfred R.; Martinez, Ferdinand; Runyan, I. V.; and Barry, Carol M. F., 4,510,223, Cl. 430-44.000.
Rupert, Gary F.: *See*—
MacGregor, John R.; Rupert, Gary F.; and Kennedy, Thomas M., 4,510,365, Cl. 219-69.00G.
Ruppender, Uwe, to Boehringer Mannheim GmbH. Device for the optical identification of a coding on a diagnostic test strip. 4,510,383, Cl. 235-462.000.
Ruprecht, Jurgen; and Weltersbach, Wolfgang, to U.S. Philips Corporation. Circuit for adjusting the amplitude of a color signal. 4,510,521, Cl. 358-27.000.
Russ, David E., to Allis-Chalmers Corp. Agricultural implement with hinge connection for folding cross shaft. 4,509,602, Cl. 172-311.000.
Russo, Frank D.: *See*—
Leech, Edward J.; and Russo, Frank D., 4,510,276, Cl. 523-427.000.
Rust, Meinhard: *See*—
Kramann, Bernhard; and Rust, Meinhard, 4,509,945, Cl. 604-164.000.
Rutgerswerke Aktiengesellschaft: *See*—
Tonnius, Dietrich; Weiss, Wolfgang; Orth, Winfried; Miele, Heinrich; and Pastorek, Emmerich, 4,510,090, Cl. 260-396.00R.
Rutishauser, Albert. Mechanically-operated magazine-unloading, sheet-feeding mechanism for sheet processing apparatus. 4,509,734, Cl. 271-10.000.
Rutsch, Werner: *See*—
Kirchmayr, Rudolf; and Rutsch, Werner, 4,510,290, Cl. 525-162.000.
Ryan, W. Kenneth. Alphanumeric section of office machine keyboards. 4,509,873, Cl. 400-489.000.
Ryder, Alan, to Schlumberger Electronics (U.K.) Limited. Methods and apparatus for frequency response analysis. 4,510,440, Cl. 324-77.00G.
Ryobi Ltd.: *See*—
Ozaki, Kiyomi; and Tunoda, Kikuo, 4,509,704, Cl. 242-84.20A.
Saar, David C., to Colgate-Palmolive Company. Retarding setting of crutcher slurry for manufacturing base beads for detergent compositions. 4,510,066, Cl. 252-140.000.
Sabatino, Anthony; Stanefski, Eugene F.; Romanchuk, Ronald N.; and Schaumburg, Edward G., to GNB Batteries Inc. Method and apparatus for assembling battery components. 4,509,252, Cl. 29-623.100.
Sachs, Hanns I.: *See*—
Winkler, Hermann; and Sachs, Hanns I., 4,510,184, Cl. 427-212.000.
Sachs-Systemtechnik GmbH: *See*—
Tellert, Rudy, 4,509,625, Cl. 192-0.033.
Saeki, Naomi: *See*—
Oka, Yutaka; Saeki, Naomi; and Fuseya, Yoshiharu, 4,510,229, Cl. 430-265.000.
Saffer, Gary M.: *See*—
Lambert, Gerard L.; and Saffer, Gary M., 4,509,931, Cl. 446-462.000.
SAFT: *See*—
Adam, Michel, 4,510,215, Cl. 429-99.000.
Sahara, Masayoshi: *See*—
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,509,846, Cl. 354-442.000.
Sahota, Harvinder. Hemostat with blood flow sensor. 4,509,528, Cl. 128-691.000.
St. Clair, Anne K.; Stoakley, Diane M.; St. Clair, Terry L.; and Singh, Jag J., to United States of America, National Aeronautics and Space

Administration. Process for improving moisture resistance of epoxy resins by addition of chromium ions. 4,510,277, Cl. 523-454.000.

St. Clair, Terry L.: *See—*
St. Clair, Anne K.; Stoakley, Diane M.; St. Clair, Terry L.; and Singh, Jag J., 4,510,277, Cl. 523-454.000.

St. Florian Company, Ltd.: *See—*
Klievoneit, Harold R., 4,509,298, Cl. 51-237.00R.

St. Jean, Herbert N.; and Settanni, Richard, to Cerberus AG. Passive infrared intrusion detector. 4,510,488, Cl. 340-567.000.

Saint-Martin, Bernard: *See—*
Mercey, Gilles; Picard, Claude; and Saint-Martin, Bernard, 4,509,505, Cl. 128-1.00B.

Saito, Kenji; and Yamachika, Hiroshi, to Sumitomo Chemical Company, Limited. Process for preparing cyclopentenolones. 4,510,329, Cl. 568-310.000.

Saji, Keiichi: *See—*
Takeuchi, Takashi; Takahashi, Hideaki; Saji, Keiichi; Kondo, Haruyoshi; and Hayakawa, Kiyoharu, 4,510,036, Cl. 204-425.000.

Sak, Dennis A.; and Mestetsky, Thomas, to Arvey Corporation. Self-sealing pouch for forming adhesive-to-adhesive seal. 4,510,621, Cl. 383-89.000.

Sakai, Shinji; and Kawabata, Takashi, to Canon Kabushiki Kaisha. Automatic focusing device. 4,509,841, Cl. 354-400.000.

Sakai, Yoshiya: *See—*
Kobayashi, Minoru; Sakai, Yoshiya; Minato, Shoji; Ooe, Tsuguo; Arai, Katsumi; and Suga, Tetsuo, 4,510,374, Cl. 219-146.100.

Sakamoto, Masaharu: *See—*
Ishida, Kohji; and Sakamoto, Masaharu, 4,510,452, Cl. 328-144.000.

Sakamoto, Shinichiro, to Toyoda Koki Kabushiki Kaisha. Tool changer. 4,509,235, Cl. 29-26.00A.

Sakamoto, Yoshisuke: *See—*
Sugizaki, Takashi; and Sakamoto, Yoshisuke, 4,509,661, Cl. 222-190.000.

Sakashita, Shigeru; Nakagawa, Takeshi; Ohwaki, Takayuki; and Miyake, Yasuo, to Eisai Co., Ltd. Process for sealing body and cap of gelatin hard capsule and apparatus therefor. 4,510,168, Cl. 427-3.000.

Sakatani, Yoshiaki: *See—*
Yamaguchi, Yasuhiro; and Sakatani, Yoshiaki, 4,510,103, Cl. 264-40.200.

Sako, Kiyohide: *See—*
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; Sugihara, Taisuke; Takagi, Seiji; and Sako, Kiyohide, 4,510,307, Cl. 544-283.000.

Sakurai Machine Trading Co., Ltd.: *See—*
Nagatani, Kazuo, 4,509,422, Cl. 101-118.000.

Salice, Luciano, to Arturo Salice, S.p.A. Concealed hinge having a spring biased U-shaped slider. 4,509,229, Cl. 16-327.000.

Salmonson, Duane L., to Economics Laboratory, Inc. Magnetic reversing mechanism. 4,509,402, Cl. 91-275.000.

Samowich, Joseph J. Bullet-proof protective shielding and garments and methods of making the same and use thereof. 4,510,200, Cl. 428-252.000.

Samuels, Kenneth E.: *See—*
Duke, June T.; Samuels, Kenneth E.; and Brown, Mary-Catherine, 4,510,204, Cl. 428-463.000.

Sander, Hans: *See—*
Gimpel, Jurgen; Jackel, Klaus-Peter; and Sander, Hans, 4,510,284, Cl. 524-379.000.

Sanders, Albert J., Jr.; and Larson, Michael J., to SWS Silicones Corporation. Coating compositions. 4,509,981, Cl. 106-3.000.

Sanders Associates, Inc.: *See—*
Nussdorfer, Theodore J.; and Kesseli, James B., 4,509,333, Cl. 60-723.000.

Sandor, John. Draught excluding strips. 4,509,999, Cl. 156-71.000.

Sandoz Ltd.: *See—*
Berthold, Richard, 4,510,150, Cl. 514-338.000.
Meyes, Peter, 4,510,137, Cl. 514-80.000.

Sandstrom, Kjell: *See—*
Uomala, Vilho; Karkkainen, Jouko; and Sandstrom, Kjell, 4,509,719, Cl. 251-214.000.

Sanitek Products, Inc.: *See—*
Bronner, James A.; Moore, John D.; and Dale, Paul R., 4,510,081, Cl. 252-603.000.

Sanofi, S.A.: *See—*
Demarne, Henri; and Wagnon, Jean, 4,510,315, Cl. 548-455.000.

Santmyer, Kenneth R., Jr. Convertible log splitting device. 4,509,573, Cl. 144-193.00D.

Santrade Ltd.: *See—*
Hofling, Mats E., 4,509,887, Cl. 408-239.00R.

Sanyo Electric Co., Ltd.: *See—*
Ito, Hisao, 4,510,589, Cl. 369-11.000.
Sato, Takehisa, 4,510,563, Cl. 363-20.000.

Sarma, Kalluri R.: *See—*
Ellis, Ralph J.; Gurtler, Richard W.; and Sarma, Kalluri R., 4,510,015, Cl. 156-617.00R.

Sasaki, Isao: *See—*
Kishida, Kazuo; Sasaki, Isao; Mukai, Nobuhiro; and Asai, Hajime, 4,510,024, Cl. 204-59.00R.

Sasaki, Takafumi, to Tokyo Shibaura Denki Kabushiki Kaisha. Locking device for door of cooking apparatus. 4,509,779, Cl. 292-254.000.

Sasaki, Toshimi: *See—*
Hachisu, Takeshi; Taguchi, Keiji; Sasaki, Toshimi; Matsumoto, Tetsuo; and Hidao, Nobuyoshi, 4,509,995, Cl. 148-143.000.

Sasaki, Yasuharu: *See—*
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; Sugihara, Taisuke; Takagi, Seiji; and Sako, Kiyohide, 4,510,307, Cl. 544-283.000.

Sasamoto, Aiao, to Hitachi, Ltd. Magnetic disk storage unit with reciprocating magnetic head for cleaning the magnetic disc. 4,510,541, Cl. 360-97.000.

Sasib S.p.A.: *See—*
Payne, Kenneth G., 4,509,634, Cl. 198-347.000.

Sasso, Bill J., to Servo Technology Corp. Servo rotary motor. 4,510,420, Cl. 318-37.000.

Sato, Noriya: *See—*
Honjo, Katsuhiko; Taki, Hiromitsu; and Sato, Noriya, 4,510,179, Cl. 427-96.000.

Sato, Seiji; and Takeuchi, Koichi, to Sony Corporation. Magnetic recording apparatus. 4,510,538, Cl. 360-84.000.

Sato, Takehisa, to Sanyo Electric Co. Ltd.; and Tokyo Sanyo Electric Co., Ltd. Switching power supply. 4,510,563, Cl. 363-20.000.

Sato, Tetsuo; Kominami, Yasuo; Takizawa, Yoshiyuki; and Haeno, Akira, to Hitachi, Ltd.; and Pioneer Electronic Corp. Amplifier circuit. 4,510,458, Cl. 330-260.000.

Satoh, Akihiro: *See—*
Chiba, Hiromasa; Obama, Kenjiro; Kawazoe, Shunji; Oka, Takahiro; and Satoh, Akihiro, 4,510,292, Cl. 525-247.000.

Satoh, Yutaka: *See—*
Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, 4,510,513, Cl. 346-214.000.

Sauer, Donald J.: *See—*
Pritchard, Dalton H.; and Sauer, Donald J., 4,510,522, Cl. 358-31.000.

Savard, Guy; and Lee, Robert G. H., to Canadian Liquid Air Ltd/Air Liquide. In situ combustion for oil recovery. 4,509,595, Cl. 166-261.000.

Sawa, Tetsuo: *See—*
Asami, Shojiro; Ozawa, Kazuo; and Sawa, Tetsuo, 4,510,546, Cl. 360-133.000.

Sawanishi, Shigeru; Shiomi, Yozo; and Yamane, Akira, to Japan Exlan Company Limited. Process for producing acrylic fibers having non-circular cross-sections. 4,510,111, Cl. 264-177.00F.

Sawyer, James L.: *See—*
Davidovits, Joseph; and Sawyer, James L., 4,509,985, Cl. 106-84.000.

Saxman, William C.; and Parker, Larry J., to Dresser Industries, Inc. Compressible pressure compensator within closed lubricant volume of an earth boring apparatus. 4,509,607, Cl. 175-227.000.

Scallan, Anthony M.: *See—*
Green, Harold V.; Fox, Thomas J.; and Scallan, Anthony M., 4,510,020, Cl. 162-169.000.

Scan Screen A/S: *See—*
Clausen, Erik; and Clausen, Johannes, 4,509,822, Cl. 350-128.000.

Scanlon, James E., to Ross Operating Valve Company. Flow control for valve interface. 4,509,556, Cl. 137-884.000.

Schaal, Gunter; and Schramm, Heribert, to Robert Bosch GmbH. Workbench with removable vise. 4,509,731, Cl. 269-78.000.

Schacher, Ronald A. Method for inhibiting contraction of ophthalmic wounds or incisions. 4,510,145, Cl. 514-415.000.

Schaeffer, Hans-Joachim: *See—*
Koch, Klaus; Schaeffer, Hans-Joachim; and Syrbius, Gerhard, 4,509,419, Cl. 100-117.000.

Schaetzke, Ulrike: *See—*
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,510,068, Cl. 252-186.290.

Schafer, Gunter, to Security Lumber & Supply Co. Locking detent for corrugated tube. 4,509,560, Cl. 138-122.000.

Schall, Walter; Negro, Guido; Hipp, Martin; and Albrecht, Hans, to Bielomatik Leuze GmbH & Co. Apparatus for making holes in thick stacks of paper. 4,509,396, Cl. 83-126.000.

Schatteman, Etienne A., to Staar S.A. Slot type disc recorder and/or player apparatus. 4,510,591, Cl. 369-77.100.

Schaumburg, Edward G.: *See—*
Sabatino, Anthony; Stanefski, Eugene F.; Romanchuk, Ronald N.; and Schaumburg, Edward G., 4,509,252, Cl. 29-623.100.

Scheiderich, Robert F.; and Comper, Louis F., to Goodyear Tire & Rubber Company, The. Method for preparing tire curing bladder lubricant. 4,509,984, Cl. 106-38.220.

Schenk, Raymond L.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,509,581, Cl. 164-479.000.

Schenker Maschinen AG: *See—*
Frei, Max, 4,509,352, Cl. 72-138.000.

Scheuble, Bernhard: *See—*
Eidenschink, Rudolf; Haas, Gunther; Pohl, Ludwig; Romer, Michael; Scheuble, Bernhard; and Weber, Georg, 4,510,069, Cl. 252-299.610.

Scheuermann, Helmut: *See—*
Gockler, Heinz; and Scheuermann, Helmut, 4,510,598, Cl. 370-50.000.

Schilling, Wolfgang: *See—*
Romes, Roman; Schilling, Wolfgang; and Werner, Jurgen, 4,510,474, Cl. 336-30.000.

Schipper, John F.: *See—*
George, E. Victor; and Schipper, John F., 4,510,605, Cl. 372-23.000.

Schlaikjer, Carl R.: *See—*
Gopikanth, Mysore L.; Kuo, Han C.; and Schlaikjer, Carl R., 4,510,220, Cl. 429-225.000.
Schlatzer, Robert K.: *See—*
Huang, Chor; and Schlatzer, Robert K., 4,509,949, Cl. 586-558.000.
Schlienger, Max P.; and Szeto, Whalun, to Retech, Inc. High speed electric arc saw and method of operating same. 4,510,368, Cl. 219-69.00M.
Schlosser, Willy: *See—*
Heimel, Helmut; Schlosser, Willy; and Luttenberger, Alfred, 4,509,274, Cl. 34-114.000.
Schlumberger Electronics (U.K.) Limited: *See—*
Ryder, Alan, 4,510,440, Cl. 324-77.00G.
Schlumberger Technology Corporation: *See—*
Upchurch, James M., 4,509,604, Cl. 175-4.520.
Schmid, August, to Patentverwertungs-u, Finanzierungsgesellschaft Seranta AG. Returned bowling ball lifting apparatus. 4,509,752, Cl. 273-49.000.
Schmidt, Robert R.: *See—*
Forster, Heinz; Hofer, Wolfgang; Mues, Volker; Eue, Ludwig; and Schmidt, Robert R., 4,509,971, Cl. 71-90.000.
Schmidt, Rudolf: *See—*
Cornely, Wolfgang; Esser, Heinz; and Schmidt, Rudolf, 4,510,180, Cl. 427-136.000.
Schmidt, Werner; and Jahn, Franz, to Motoren-und Turbinen-Union Munchen GmbH. Process for creating a support means for a component part to be reworked and/or repaired and a welding device obtained according to said process. 4,509,673, Cl. 228-212.000.
Schmidt, Werner J.; Dijkshoorn, Willem; Stratmann, Wilhelm; and Vermaas, Leo F., to Lever Brothers Company. Margarine fat blend. 4,510,167, Cl. 426-607.000.
Schmuck, Johann. Piston machine. 4,509,474, Cl. 123-192.00B.
Schnacke, Arthur W., to United States of America, Energy. Fuel cell stack with internal manifolds for reactant gases. 4,510,213, Cl. 429-36.000.
Schnaibel, Eberhard: *See—*
Junginger, Erich; Rittsmannsberger, Norbert; and Schnaibel, Eberhard, 4,509,628, Cl. 192-0.094.
Schneider, Gerhart: *See—*
Mengel, Rudolf; Schroder, Ludwig; Stransky, Werner; Linden, Gerbert; Schneider, Gerhart; and Lust, Sigmund, 4,509,972, Cl. 71-92.000.
Schneider, Otto, to Maag Gear-Wheel & Machine Company Limited. Method and arrangement for the evaluation of signals from an ultrasonic displacement path measuring system. 4,510,587, Cl. 367-118.000.
Schneider, William C., to Alco Foodservice Equipment Company. Variable timing system for toasters and similar appliances. 4,510,376, Cl. 219-492.000.
Schneider, William R.; and Smith, Robert B., to Gas Research Institute. Blind side sealer apparatus and method. 4,509,243, Cl. 29-402.020.
Schole, Juergen: *See—*
Lechtken, Peter; Nuerrenbach, Axel; and Schole, Juergen, 4,510,146, Cl. 514-312.000.
Scholten, Carel S.; Slob, Arie; and Jansen, Pierre G., to U.S. Philips Corporation. System comprising mutually synchronizing first and second active functional units. 4,510,612, Cl. 375-106.000.
Schonberger, Johann; Bloo, Johann; Mistlberger, Bruno; and Gehmaier, Johann, to Chemiefaser Lenzing Aktiengesellschaft. Circular loom. 4,509,562, Cl. 139-13.00R.
Schontzler, James G.: *See—*
Livingston, James W.; and Schontzler, James G., 4,509,543, Cl. 134-57.00D.
Schowiak, Duane C., to Ford Motor Company. Color change apparatus. 4,509,684, Cl. 239-112.000.
Schramm, Arthur G., deceased; by Hardy, Doralyn A., personal representative; and Shaffer, Jack C. Method and apparatus for fabricating insulative panel. 4,510,010, Cl. 156-383.000.
Schramm, Heribert: *See—*
Schaal, Gunter; and Schramm, Heribert, 4,509,731, Cl. 269-78.000.
Schreiber, William L.: *See—*
Boden, Richard M.; Schreiber, William L.; Fujioka, Futoshi; Chant, Patrick; and Dekker, Lambert, 4,510,080, Cl. 252-522.00R.
Schrenk, Jurgen, to Boehringer Mannheim GmbH. Homogeneous enzyme immunoassay with heating step after incubation, THERESIA. 4,510,240, Cl. 435-7.000.
Schroder, Ludwig: *See—*
Mengel, Rudolf; Schroder, Ludwig; Stransky, Werner; Linden, Gerbert; Schneider, Gerhart; and Lust, Sigmund, 4,509,972, Cl. 71-92.000.
Schroeder, Donald E., Jr., to Marathon Oil Company. Polymer flow control apparatus. 4,510,397, Cl. 290-43.000.
Schrofelbauer, Herbert; Kakl, Josef; Staudinger, Gernot; and Filipot, Hermann, to Osterreichische Draukraftwerke Aktiengesellschaft. Method of and apparatus for the desulfurization of flue gas of a coal-fired combustion process. 4,509,436, Cl. 110-345.000.
Schuler, Paul D.: *See—*
Johanson, Edwin S.; and Schuler, Paul D., 4,510,037, Cl. 208-8.0LE.
Schutz, Karl H.; and Mauch, Gunter, to SKF Kugellagerfabriken GmbH. Wear measuring arrangement for bearings. 4,509,364, Cl. 73-118.000.
Schwartz, Bernard: *See—*
Kumar, Ananda H.; and Schwartz, Bernard, 4,510,000, Cl. 156-89.000.
Schwarzler, Peter, to Krauss-Maffei Aktiengesellschaft. Linear magnet. 4,510,421, Cl. 318-135.000.
Schweiger, Josef; and Hering, Bernhard, to Siemens Aktiengesellschaft. Electromagnetic relay. 4,510,473, Cl. 335-86.000.
Schweigert, Lothar L.; and Knaus, Heimo A. Modular structures having hinge and mating pin fastening means. 4,509,930, Cl. 446-109.000.
Schwinn Bicycle Company: *See—*
Brilando, Frank P., 4,509,767, Cl. 280-289.00R.
Science Applications, Inc.: *See—*
Sears, John T.; and Anada, Harish R., 4,510,124, Cl. 423-437.000.
Scieri, Frank; and Miller, Richard L., to Scieri, Frank. Two part mixable component storage container for whipped cream in flavors and corresponding colors, and the like. 4,509,641, Cl. 206-219.000.
Scott, Norman R.: *See—*
Sigrimis, Nick A.; and Scott, Norman R., 4,510,495, Cl. 340-825.540.
Scrivan, Michel A.: *See—*
Otto, Stanley W.; Rhoads, Jack G.; and Scrivan, Michel A., 4,509,825, Cl. 350-259.000.
Sealed Power Corporation: *See—*
Mullally, Charles J.; Brown, Steven L.; Anderson, David L.; and Hitchcock, Robert F., 4,509,340, Cl. 62-503.000.
Sears, John T.; and Anada, Harish R., to Science Applications, Inc. System for recovery of CO_2 from flue gases containing SO_2. 4,510,124, Cl. 423-437.000.
Secton Pty. Ltd.: *See—*
Carroll, Noel; and Phelps, Colin J., 4,510,405, Cl. 310-76.000.
Security Lumber & Supply Co.: *See—*
Schafer, Gunter, 4,509,560, Cl. 138-122.000.
Sedgewick, Richard D. Method for winding annular zig-zag windings. 4,509,564, Cl. 140-92.200.
Sedlacek, Hans-Harald: *See—*
Knop, Jurgen; Sedlacek, Hans-Harald; and Seiler, Friedrich R., 4,510,129, Cl. 424-86.000.
Seel, Holger: *See—*
Ernst, Hans-Hellmut; and Seel, Holger, 4,509,707, Cl. 242-107.40A.
Seely, James R., to Marketing Displays, Inc. Portable wind-resistant sign stand with flexible bow-type legs. 4,509,714, Cl. 248-618.000.
Seer, Harold G., Jr., to RCA Corporation. Synchronously detected DC/DC converter for regulated power supply. 4,510,564, Cl. 363-23.000.
Segre-Amar, Leonello. System and method for transmitting messages to a telephone set through the subscriber's line in a telephone system. 4,510,349, Cl. 179-2.00A.
Seiko Instruments & Electronics Ltd.: *See—*
Mitamura, Gen, 4,509,866, Cl. 368-296.000.
Seiler, Friedrich R.: *See—*
Knop, Jurgen; Sedlacek, Hans-Harald; and Seiler, Friedrich R., 4,510,129, Cl. 424-86.000.
Seitz Enzinger Noll Maschinenbau AG: *See—*
Ahlers, Egon, 4,509,565, Cl. 141-39.000.
Seitz, Hans: *See—*
Funk, Heinrich; Pakur, Henryk; and Seitz, Hans, 4,509,575, Cl. 152-356.00R.
Seki, Masaki: *See—*
Kishi, Hajimu; and Seki, Masaki, 4,510,568, Cl. 364-300.000.
Sekine, Youji: *See—*
Suzuki, Akio; Akiyama, Mitsuo; Uzuhashi, Hideo; Ochiai, Izumi; Yamashita, Hitoshi; Sekine, Youji; Matsui, Katsuo; and Tomita, Syuji, 4,509,354, Cl. 72-294.000.
Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Matsumura, Michio; Inoue, Takao; and Arai, Toshihiro, 4,510,031, Cl. 204-159.200.
Sekiya, Takuro: *See—*
Horike, Masanori; Furukawa, Tatsuya; Sekiya, Takuro; Ebi, Yutaka; Isayama, Takuro; and Tachiki, Masaaki, 4,510,509, Cl. 346-140.00R.
Sell, William J.; Peisach, Joel M.; and Riege, David H., to Mast Immunosystems, Ltd. Photo chamber for recording chemical reactivity. 4,510,393, Cl. 250-475.200.
Seltzer, Leonard W. Watering device for animals. 4,509,460, Cl. 119-74.000.
Sensormedics Corporation: *See—*
Luper, Charles R., 4,509,551, Cl. 137-554.000.
Seo, Yasutsugu, to Tokyo Shibaura Denki Kabushiki Kaisha. Ultrasonic diagnostic equipment. 4,509,525, Cl. 128-663.000.
Servo Technology Corp.: *See—*
Sasso, Bill J., 4,510,420, Cl. 318-37.000.
Seshimoto, Osamu, to Fuji Photo Film Co., Ltd. Liquid transporting and distributing device and ionic activity measuring device using the same. 4,510,035, Cl. 204-411.000.
Settanni, Richard: *See—*
St. Jean, Herbert N.; and Settanni, Richard, 4,510,488, Cl. 340-567.000.
Seymour, Robert W.: *See—*
Weemes, Doyle A.; and Seymour, Robert W., 4,510,205, Cl. 428-483.000.
Shaffer, Jack C.: *See—*
Schramm, Arthur G., deceased; Hardy, Doralyn A., personal representative; and Shaffer, Jack C., 4,510,010, Cl. 156-383.000.
Shah, Kishore R., to Kendall Company, The. Water vapor permeable pressure sensitive adhesives incorporating modified acrylate copolymers. 4,510,197, Cl. 428-220.000.

Shalaby, Shalaby W.: *See*—
Bezwada, Rao S.; Shalaby, Shalaby W.; and Jamiolkowski, Dennis D., 4,510,295, Cl. 525-437.000.

Shaw, Charles R., to Esmet, Inc. Rope clamp construction. 4,509,233, Cl. 24-136.00R.

Shaw, Daniel, to General Motors Corporation. Stationary continuous automatic pouring apparatus. 4,509,578, Cl. 164-155.000.

Shea, Lance L. Weight lifter's belt incorporating pulley mechanism. 4,509,214, Cl. 2-322.000.

Sheek, Roy S., to Fairchild Industries, Inc. Track fastener. 4,509,888, Cl. 410-105.000.

Shell Oil Company: *See*—
Kruka, Vitold R.; Kipp, Robert M.; and Cadena, Edward R., 4,510,588, Cl. 367-165.000.
Lewis, Robert M.; Ott, Kevin C.; and Van Santen, Rutger A., 4,510,257, Cl. 502-63.000.
Stewart, Thomas L.; and Demny, Florian C., 4,510,060, Cl. 210-746.000.

Shelton, Joseph T.: *See*—
Pease, Floyd T.; and Shelton, Joseph T., 4,509,448, Cl. 114-293.000.

Shepherd, C. Barrett, to C. E. Shepherd Company, Inc. Shellfish trap. 4,509,288, Cl. 43-102.000.

Sherk, Fred T.: *See*—
Cleary, James W.; Sherk, Fred T.; and Nesheiwat, Afif M., 4,510,316, Cl. 548-555.000.

Sherman, David M., to John Fluke Mfg. Co., Inc. Apparatus for digitally controlled calibration of frequency response of amplifiers. 4,510,454, Cl. 330-2.000.

Sherman, Guy J., to Sherman Laboratories, Inc. Soft contact lens preservative system, prophylactic cleaner and method. 4,510,065, Cl. 252-106.000.

Sherman Laboratories, Inc.: *See*—
Sherman, Guy J., 4,510,065, Cl. 252-106.000.

Sherman, Randy J.; and Hanson, Derald F., to Lincoln Laser Company. Optical beam pulse generator. 4,509,819, Cl. 350-6.700.

Sherritt Gordon Mines Limited: *See*—
Bolton, Gerald L.; and Weir, Donald R., 4,510,028, Cl. 204-119.000.

Sherwood, Kent. Method of manufacturing a surface-reinforced foam article. 4,510,105, Cl. 264-46.600.

Shevchuk, George J., to Bell Telephone Laboratories, Inc. Unitary construction circuit pack carrier. 4,509,647, Cl. 211-41.000.

Shibata, Akira: *See*—
Miura, Kuniaki; Shibata, Akira; Yamada, Jun; and Hazama, Katashi, 4,510,530, Cl. 358-314.000.

Shibata, Katsuji: *See*—
Kanno, Tadaaki; Ukai, Takeshi; Akahoshi, Yutaka; and Shibata, Katsuji, 4,509,732, Cl. 270-37.000.

Shike, Toyohiko: *See*—
Yoshida, Kenji; Nakazawa, Makoto; Shike, Toyohiko; Tomida, Masayuki; Tsuda, Masataka; and Teraoka, Toru, 4,510,154, Cl. 514-365.000.

Shima, Tetsuo: *See*—
Yamazaki, Toshinori; Nomori, Hiroyuki; Matsuzaki, Masatoshi; Shima, Tetsuo; and Myokan, Isao, 4,510,224, Cl. 430-57.000.

Shimano Industrial Company Limited: *See*—
Hotta, Masashi, 4,509,645, Cl. 206-545.000.

Shimasaki, Keiichi: *See*—
Takenaka, Akira; Shimasaki, Keiichi; and Kuwazuru, Yasumitsu, 4,509,803, Cl. 308-5.00R.

Shimatani, Saburo: *See*—
Hira, Yutaka; Ukai, Yoshitaka; Akuzawa, Yoshihide; Aoki, Osamu; and Shimatani, Saburo, 4,509,874, Cl. 400-691.000.

Shimizu, Keiichiro: *See*—
Tanabe, Kenzo; and Shimizu, Keiichiro, 4,510,517, Cl. 357-34.000.

Shimogawara, Jun, to NEC Corporation. Character selecting and inked ribbon feeding mechanism for a serial printer. 4,509,872, Cl. 400-144.100.

Shimoni, Moshe: *See*—
Cais, Michael; and Shimoni, Moshe, 4,510,058, Cl. 210-657.000.

Shimotsuma, Wataru: *See*—
Hotta, Shu; Hosaka, Tomiharu; and Shimotsuma, Wataru, 4,510,089, Cl. 260-396.00N.

Shimura, Tatsuo, to Yasui Sangyo Co., Ltd. Portable hydraulic lifting jack. 4,509,723, Cl. 254-93.00H.

Shinko Kosen Kogyo Kabushiki Kaisha: *See*—
Yoshida, Tatsuo; Fukuda, Kikuo; and Tomiguchi, Akihiko, 4,509,319, Cl. 57-218.000.

Shinozaki, Takashi: *See*—
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.

Shintani, Koichi, to Colleen Pencil Co., Ltd. Felt pen having two end caps. 4,509,875, Cl. 401-34.000.

Shiomi, Yozo: *See*—
Sawanishi, Shigeru; Shiomi, Yozo; and Yamane, Akira, 4,510,111, Cl. 264-177.00F.

Shiozawa, Takao, to Konishiroku Photo Industry Co., Ltd. Sheet feeding means. 4,509,737, Cl. 271-125.000.

Shipchandler, Mohammed T.: *See*—
Kirkemo, Curtis L.; and Shipchandler, Mohammed T., 4,510,251, Cl. 436-536.000.

Shirataki, Kenji, to Tokai Shoji Co. Ltd. Apparatus for applying emulsion onto screen printing plate. 4,509,455, Cl. 118-696.000.

Shkawrytko, Victor: *See*—
Wagner, Peter; and Shkawrytko, Victor, 4,510,350, Cl. 179-5.00P.

Shtarkman, Emile M., to Imperial Clevite Inc. Flexible wall spring damper. 4,509,730, Cl. 267-35.000.

Shuman, Ralph J., to Dennison Manufacturing Company. Thermal ink transfer recording. 4,510,206, Cl. 428-488.100.

Shuman, Richard F.: *See*—
Blacklock, Thomas J.; and Shuman, Richard F., 4,510,083, Cl. 260-112.50R.

Shuman, Robert T.: *See*—
Geselchen, Paul D.; and Shuman, Robert T., 4,510,082, Cl. 260-112.50R.

Siebert, Oliver W., to Monsanto Company. Clad metal joint closure. 4,510,171, Cl. 427-34.000.

Sielaff GmbH & Co. Automatenbau Herrieden: *See*—
Mehlan, Bernd; and Gress, Josef, 4,509,339, Cl. 62-450.000.

Siemens Aktiengesellschaft: *See*—
Assbeck, Franz; and Fleckenstein, Volker, 4,510,434, Cl. 323-237.000.
Riedl, Hermann, 4,510,448, Cl. 324-309.000.
Schweiger, Josef; and Hering, Bernhard, 4,510,473, Cl. 335-86.000.
Sohrt, Christian, 4,510,395, Cl. 290-3.000.

Siff, Bradford E.; and Siff, Elliott J. Mail box. 4,509,675, Cl. 232-17.000.

Siff, Elliott J.: *See*—
Siff, Bradford E.; and Siff, Elliott J., 4,509,675, Cl. 232-17.000.

Sigma-Tau Industrie Farmaceutiche Riunite S.p.A.: *See*—
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and de Witt, Paolo, 4,510,318, Cl. 560-147.000.

Signode Corporation: *See*—
Klaus, Artur; and Wilhelm, Hans, 4,509,668, Cl. 227-8.000.

Sigrimis, Nick A.; and Scott, Norman R., to Cornell Research Foundation, Inc. Remote passive identification system. 4,510,495, Cl. 340-825.540.

Simich, Emil, to A.J. Gerrard & Company. Bale tie joining devices. 4,509,416, Cl. 100-25.000.

Simms, John A.: *See*—
Lindsey, Roland G.; and Simms, John A., 4,510,298, Cl. 526-87.000.

Simon, Lionel N.: *See*—
Hadden, John W.; Simon, Lionel N.; and Giner-Sorolla, Alfredo, 4,510,144, Cl. 514-257.000.

Simone, Pregermain; Henri, Charcosset; and Michele, Andres, to Charbonnages de France; and Gaz de France. Process for the liquid phase hydrogenation of coal. 4,510,039, Cl. 208-10.000.

Simpson, Raymond A., Jr. Water driven scrubber for hand held shower head. 4,509,221, Cl. 15-29.000.

Sims, James O. Rotary pump assembly container. 4,509,897, Cl. 415-113.000.

Simula Inc.: *See*—
Desjardins, Stanley P.; and Warrick, James C., 4,509,621, Cl. 188-372.000.

Singer Company, The: *See*—
Barrett, Michael E.; Koon, Randy G.; and Laughon, Thomas C., 4,510,404, Cl. 310-50.000.
Howe, Clarice M.; and Mack, Audrey, 4,509,444, Cl. 112-262.100.

Singh, Jag J.: *See*—
St. Clair, Anne K.; Stoakley, Diane M.; St. Clair, Terry L.; and Singh, Jag J., 4,510,277, Cl. 523-454.000.

Sintered Metals, Inc.: *See*—
Jaffe, Myron I., 4,509,632, Cl. 194-4.00D.

Sipple, Douglas E.; and Wolstenholme, Charles T. Gun cleaning tool. 4,509,223, Cl. 15-160.000.

Sitt, Rudiger: *See*—
Kabbe, Hans-Joachim; Krause, Hans-Peter; and Sitt, Rudiger, 4,510,156, Cl. 514-415.000.

Sivyer, Robert B. Thermowell apparatus. 4,510,343, Cl. 136-242.000.

Sjonell, Goran. Method of mixing one substance with another substance. 4,509,861, Cl. 366-131.000.

Skaletz, Heinz: *See*—
Riemann, Hanns-Helmut; Sonnenschein, Hans; and Skaletz, Heinz, 4,509,697, Cl. 241-72.000.

SKF Kugellagerfabriken GmbH: *See*—
Brandenstein, Manfred; Hans, Rudiger; and Kiener, Heinz, 4,509,764, Cl. 277-166.000.
Schutz, Karl H.; and Mauch, Gunter, 4,509,364, Cl. 73-118.000.

Skinner, Robert T. J., to Lucas Industries Public Limited Company. Fuel injection nozzles. 4,509,691, Cl. 239-533.900.

Skinner, Ronald W.; Tao, John C.; and Znaimer, Samuel, to International Coal Refining Company. Coal liquefaction process. 4,510,040, Cl. 208-10.000.

Skogberg, Bo T.; and Romell, Gunnar V. R., to Atlas Copco Aktiebolag. Method of rock bolting and tube-formed expansion bolt. 4,509,889, Cl. 411-19.000.

SKW Trostberg Aktiengesellschaft: *See*—
Goll, Werner, 4,510,282, Cl. 524-337.000.

Slater, Christopher J., to Dunlop Limited. Flexible hose. 4,509,558, Cl. 138-104.000.

Slattery, Gordon C., to Brunswick Corp. Starting enrichment of alternate firing two cycle internal combustion engine. 4,509,472, Cl. 123-179.00G.

Slob, Arie: *See*—
Scholten, Carel S.; Slob, Arie; and Jansen, Pierre G., 4,510,612, Cl. 375-106.000.

Slominski, John T.: *See*—
Bursh, Talmage P., Jr.; Davis, Dean I.; Slominski, John T.; and Swartz, Raymond K., 4,510,346, Cl. 174-36.000.

Small, Maynard E. Bingo game involving promotional coupons. 4,509,759, Cl. 273-269.000.

Smith, Alfred A., to Guardian Products Company, Inc. Height adjustable crutch. 4,509,741, Cl. 272-69.000.
Smith, C. Bruce. Aquaculture harvester. 4,509,285, Cl. 43-9.000.
Smith, Edgar L. Device for extracting valve packing. 4,509,392, Cl. 81-8.100.
Smith, Gary F.: *See*—
Fox, Daniel W.; Peters, Edward N.; and Smith, Gary F., 4,510,289, Cl. 525-148.000.
Smith, Jane E.; and Whitford, Rowland E., to Babcock & Wilcox Company, The. Control system for an electro-pneumatic converter. 4,509,547, Cl. 137-85.000.
Smith, Jeffrey C., to Branson Ultrasonics Corporation. Vapor degreaser apparatus. 4,510,053, Cl. 210-175.000.
Smith, Malcolm S., to Du Pont de Nemours, E. I., and Company. Tack-free polymer pellets. 4,510,281, Cl. 524-229.000.
Smith, Morley L.: *See*—
Allison, Philip J.; and Smith, Morley L., 4,509,226, Cl. 15-257.060.
Smith, Nicholas K.: *See*—
Costello, Peter E.; Fossett, Lawrence D.; Lane, Michael S.; Quin, Terrence T.; and Smith, Nicholas K., 4,510,351, Cl. 179-27.00D.
Smith, Richard H., Sr., to Universal Spiralweld Enterprises, Inc. Helical seamed structural vessel and method of forming same. 4,509,447, Cl. 114-65.00R.
Smith, Robert B.: *See*—
Schneider, William R.; and Smith, Robert B., 4,509,243, Cl. 29-402.020.
Smith, Robert L.; and Graham, Samuel L., to Merck & Co., Inc. 6(or 5)-Hydroxybenzothiazole-2-sulfonamide-O-sulfate salts for the topical treatment of elevated intraocular pressure. 4,510,155, Cl. 514-276.000.
Smith, Thomas P.: *See*—
Wolfe, Earle C., deceased; Jobsky, William G.; and Smith, Thomas P., 4,510,487, Cl. 340-566.000.
Smith, Veronica. Three-dimensional greeting card. 4,509,280, Cl. 40-486.000.
Smith, Walter E. Slide bar guitar. 4,509,400, Cl. 84-293.000.
Smither, Miles A.: *See*—
Mayo, Franklin W.; and Smither, Miles A., 4,510,585, Cl. 367-43.000.
Smythe, Robert A.; Bunkenburg, Joachim; and Richardson, Gunnar D., to GCA Corporation/Tropel Division. Compact, linear measurement interferometer with zero abbe error. 4,509,858, Cl. 356-358.000.
Snyder, Daniel S., to Imperial Clevite Inc. Piezoelectric reed power supply for use in abnormal tire condition warning systems. 4,510,484, Cl. 340-58.000.
Sobin, Sidney S.; and Netto, Daniel J. Tapered torque strain relief coupling. 4,509,877, Cl. 403-41.000.
Sohne, Eric R.: *See*—
Costello, Samuel J.; and Sohne, Eric R., 4,509,255, Cl. 29-753.000.
Sohrt, Christian, to Siemens Aktiengesellschaft. Double-axle drive for electric self-propelled railway vehicle. 4,510,395, Cl. 290-3.000.
Sokoler, Henryk; and Pedersen, Eigil, to Everlite A/S. Panel for self-supporting roof structures comprising elongated extruded profile elements of plastics material closed at their ends, and closing member for such profile elements. 4,509,306, Cl. 52-302.000.
Solleder, Friedrich; Krohn, Hellmut; Burckhardt, Manfred; and Brugger, Franz, to Daimler-Benz Aktiengesellschaft. Installation for charging a pressure reservoir provided as a pressure source within a propulsion control system of a motor vehicle. 4,509,802, Cl. 303-110.000.
Sommers, Hans: *See*—
Lorenz, Werner; Bathke, Heinz; and Sommers, Hans, 4,509,913, Cl. 431-90.000.
Sonat Offshore Drilling Inc.: *See*—
Pease, Floyd T.; and Shelton, Joseph T., 4,509,448, Cl. 114-293.000.
Sone, Takanori: *See*—
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; Sugihara, Taisuke; Takagi, Seiji; and Sako, Kiyohide, 4,510,307, Cl. 544-283.000.
Sonnenschein, Hans: *See*—
Riemann, Hanns-Helmut; Sonnenschein, Hans; and Skaletz, Heinz, 4,509,697, Cl. 241-72.000.
Sony Corporation: *See*—
Amano, Katutoshi; and Kakuta, Toshio, 4,509,811, Cl. 339-17.00F.
Asami, Shojiro; Ozawa, Kazuo; and Sawa, Tetsuo, 4,510,546, Cl. 360-133.000.
Guisinger, Barrett E., 4,510,459, Cl. 330-265.000.
Kishimura, Masaaki; and Arakawa, Nobuyuki, 4,510,279, Cl. 524-144.000.
Sato, Seiji; and Takeuchi, Koichi, 4,510,538, Cl. 360-84.000.
Soos, Nicholas A.: *See*—
Cuthbert, John D.; and Soos, Nicholas A., 4,510,176, Cl. 427-82.000.
Southern Steel Company: *See*—
Young, Quentin H., 4,509,347, Cl. 70-129.000.
Southwest Medical Products, Incorporated: *See*—
Raymond, Leonard S., 4,510,436, Cl. 324-61.00P.
Southwire Company: *See*—
Powers, Frank M.; and Ogletree, Robert H., 4,509,728, Cl. 266-44.000.
Sowards, Norman K., to Energy Products of Idaho. Fluidized bed charcoal particle production system. 4,510,021, Cl. 201-4.000.
Spanjer, Keith G.: *See*—
Dubois, Jerry M.; and Spanjer, Keith G., 4,510,519, Cl. 357-81.000.
Spaziante, Placido M., to Panclor S.A. Process for electrolysis of sea water. 4,510,026, Cl. 204-95.000.
Specht, Viktor: *See*—
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,510,068, Cl. 252-186.290.
Spector, George: *See*—
Eby, Jeffrey; and Spector, George, 4,509,570, Cl. 141-390.000.
Spector, Yehiel; and Cohen, Ilan, to Spectronix Ltd. Discrimination circuitry for fire and explosion suppression apparatus. 4,509,601, Cl. 169-61.000.
Spectronix Ltd.: *See*—
Spector, Yehiel; and Cohen, Ilan, 4,509,601, Cl. 169-61.000.
Spectrospin AG: *See*—
Ernst, Richard R.; Wuthrich, Kurt; and Macura, Slobodan, 4,510,449, Cl. 324-309.000.
Spectrum Medical Industries, Inc.: *See*—
Bessman, Samuel P., 4,509,695, Cl. 241-2.000.
Speer, Lawrence L. Multiple filling method of repairing damaged material. 4,510,001, Cl. 156-98.000.
Speich, Francisco, to Textilma AG. Gear unit transforming a uniform driver to a non-uniform power take-off. 4,509,380, Cl. 74-394.000.
Spencer, Douglas A.: *See*—
Hartmann, Philip W.; Kohs, Dwight W.; Spencer, Douglas A.; and Turnbow, Garry V., 4,510,596, Cl. 370-58.000.
Sperry Corporation: *See*—
Ross, Gerald F., 4,510,496, Cl. 343-5.0BD.
Spire Corporation: *See*—
Spitzer, Mark B.; and Little, Roger G., 4,509,248, Cl. 29-572.000.
Spires, Dewayne A., to AT&T Bell Laboratories. Relay driver. 4,510,550, Cl. 361-152.000.
Spitzer, Mark B.; and Little, Roger G., to Spire Corporation. Encapsulation of solar cells. 4,509,248, Cl. 29-572.000.
Sprague Electric Company: *See*—
Burn, Ian, 4,510,175, Cl. 427-79.000.
Springer, Jeffery T.: *See*—
Teach, Eugene G.; and Springer, Jeffery T., 4,509,975, Cl. 71-100.000.
Sprung, Louis H.: *See*—
Gamze, Maurice G.; and Sprung, Louis H., 4,510,433, Cl. 322-32.000.
Squire, John S., to Tulin Corporation. Stepper motor damping circuit and a method therefor. 4,510,429, Cl. 318-696.000.
Staar S.A.: *See*—
Schatteman, Etienne A., 4,510,591, Cl. 369-77.100.
Stacy, George F., to HSS Industries, Inc. Rotary post office box and equipment enclosure. 4,509,676, Cl. 232-43.400.
Stahl, Werner; and Muller, Jurgen, to Agfa-Gevaert Aktiengesellschaft. Apparatus for manipulating stacked X-ray sheets or the like. 4,509,736, Cl. 271-11.000.
Staley, Lorie L.; and Pelaez, Joaquin, to McCormick & Company, Inc. Process for producing intermediate moisture quick-cooking beans. 4,510,164, Cl. 426-331.000.
Stallningsgruppen i Goteborg Aktiebolag: *See*—
Wallther, Harry, 4,509,711, Cl. 248-235.000.
Standard Oil Company, The: *See*—
Currie, Janie K.; and Mooney, J. Robert, 4,510,342, Cl. 585-524.000.
Duke, June T.; Samuels, Kenneth E.; and Brown, Mary-Catherine, 4,510,204, Cl. 428-463.000.
Standard Oil Company (Indiana): *See*—
Udovich, Carl A.; and Edwards, Robert C., 4,510,259, Cl. 502-209.000.
Standard Oil Co. (Ohio), The: *See*—
Pesa, Frederick A.; and Graham, Anne M., 4,510,320, Cl. 560-265.000.
Stanefski, Eugene F.: *See*—
Sabatino, Anthony; Stanefski, Eugene F.; Romanchuk, Ronald N.; and Schaumburg, Edward G., 4,509,252, Cl. 29-623.100.
Stanfield, Alvin M., Jr. Shutter construction. 4,509,290, Cl. 49-92.000.
Stanley Electric Co., Ltd.: *See*—
Kajita, Masaki; Nakaya, Tomio; Hasegawa, Shinichi; and Fujita, Hisanori, 4,510,515, Cl. 357-17.000.
Stanley Works, The: *See*—
Govang, James A.; Mee, William W.; and de Gruchy, Robert S., 4,509,648, Cl. 211-70.600.
Staubli, Sebastian: *See*—
Plattner, Eric; Staubli, Sebastian; and von Kaenel, Fred, 4,510,100, Cl. 260-508.000.
Staudinger, Gernot: *See*—
Schrofelbauer, Herbert; Kakl, Josef; Staudinger, Gernot; and Filipot, Hermann, 4,509,436, Cl. 110-345.000.
Stauffer Chemical Company: *See*—
Gray, Reed A.; and Joo, Grant K., 4,509,974, Cl. 71-100.000.
Teach, Eugene G.; and Springer, Jeffery T., 4,509,975, Cl. 71-100.000.
Ste Francaise des Products pour Catalyse Pro-Catalyse chez Institut Francais du Petrole: *See*—
Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, 4,510,255, Cl. 502-10.000.
Steag AG: *See*—
Breidenbach, Heribert; and Strauss, Udo, 4,509,437, Cl. 110-345.000.
Stefani, Giancarlo: *See*—
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, 4,510,258, Cl. 502-209.000.

Stelco Inc.: *See—* "
Cooper, David C.; and Bouchard, Kenneth J., 4,509,220, Cl. 10-86.00A.
Stelzer, Horst: *See—*
Kleinert, Michael; Moller, Rainer; and Stelzer, Horst, 4,509,456, Cl. 118-715.000.
Stenger, Richard J., to Sun Tech, Inc. Filling material for electric cable. 4,509,821, Cl. 350-96.230.
Stenzel, Otto: *See—*
Reimpell, Uwe; and Stenzel, Otto, 4,509,807, Cl. 339-9.00R.
Stephansen, Erik, to Impact Systems, Inc. Method and apparatus for drying a moving web. 4,509,270, Cl. 34-4.000.
Stephens, Joseph W.: *See—*
Weaver, Charles A.; and Stephens, Joseph W., 4,510,104, Cl. 264-40.700.
Sterimed Gesellschaft fur medizinischen Bedarf mbH: *See—*
Kramann, Bernhard; and Rust, Meinhard, 4,509,945, Cl. 604-164.000.
Sterling Drug Inc.: *See—*
Bailey, Denis M., 4,510,139, Cl. 514-234.000.
Bailey, Denis M., 4,510,158, Cl. 514-415.000.
Stern, Gerhard, to Chemie Linz Aktiengesellschaft. Process for preparing pure diacetonitrile. 4,510,099, Cl. 260-465.50R.
Stevens, Robert D.: *See—*
Ermak, Boris, 4,510,064, Cl. 252-67.000.
Stewart, Thomas L.; and Demny, Florian C., to Shell Oil Company. Measurement of bs&w in crude oil streams. 4,510,060, Cl. 210-746.000.
Steyr-Daimler-Puch Aktiengesellschaft: *See—*
Visek, Tomas, 4,509,475, Cl. 123-195.00A.
Stiefel, Edward I.; Pan, Wie-Hin; and Chianelli, Russell R., to Exxon Research and Engineering Co. Self-promoted molybdenum and tungsten sulfide hydrotreating catalysts from bis(tetrathiometallate) precursors. 4,510,260, Cl. 502-219.000.
Stirbis, James S., to Adolph Coors Company. Disk transfer system. 4,509,555, Cl. 137-625.110.
Stoakley, Diane M.: *See—*
St. Clair, Anne K.; Stoakley, Diane M.; St. Clair, Terry L.; and Singh, Jag J., 4,510,277, Cl. 523-454.000.
Stobb, Inc.: *See—*
Stobb, Walter J., 4,509,415, Cl. 100-2.000.
Stobb, Walter J., to Stobb, Inc. Method and apparatus for supplying strap to an item. 4,509,415, Cl. 100-2.000.
Stoechio-Matic AG: *See—*
Frick, Adolf, 4,509,914, Cl. 431-121.000.
Stoepel, Kurt: *See—*
Wehinger, Egbert; Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Towart, Robertson; Stoepel, Kurt; and Kazda, Stanislay, 4,510,310, Cl. 546-321.000.
Stohr, Frank-Michael: *See—*
Wild, Peter; and Stohr, Frank-Michael, 4,509,948, Cl. 8-539.000.
Stolz, Richard J.: *See—*
Muhle, Mike E.; Stolz, Richard J.; and Wright, Cecil W., 4,510,271, Cl. 523-346.000.
Stork Brabant B.V.: *See—*
Vertegaal, Jacobus G., 4,509,454, Cl. 118-681.000.
Stotz, Wolf-Gunter: *See—*
Volz, Karl; Link, Christoph; Stotz, Wolf-Gunter; and Heitmann, Peter, 4,509,237, Cl. 29-116.0AD.
Strachan, William S.; and Brodie, Alastair C., to Glaxo Group Limited. Manufacture of antibiotics. 4,510,312, Cl. 548-194.000.
Stracher, Alfred: *See—*
Platt, Herbert; and Stracher, Alfred, 4,510,130, Cl. 514-2.000.
Stransky, Werner: *See—*
Mengel, Rudolf; Schroder, Ludwig; Stransky, Werner; Linden, Gerbert; Schneider, Gerhart; and Lust, Sigmund, 4,509,972, Cl. 71-92.000.
Stratman, Bill D.: *See—*
Utton, Charles G.; and Stratman, Bill D., 4,509,709, Cl. 244-118.100.
Stratmann, Wilhelm: *See—*
Schmidt, Werner J.; Dijkshoorn, Willem; Stratmann, Wilhelm; and Vermaas, Leo F., 4,510,167, Cl. 426-607.000.
Straube, Peter: *See—*
Hahn, Ulrich; Straube, Peter; and Koch, Michael, 4,509,425, Cl. 101-216.000.
Strauss, Edgars H., deceased: *See—*
Langen, Marinus J. M.; Strauss, Edgars H., deceased; and Strauss, Leida, administrator, 4,510,620, Cl. 383-14.000.
Strauss, Leida, administrator: *See—*
Langen, Marinus J. M.; Strauss, Edgars H., deceased; and Strauss, Leida, administrator, 4,510,620, Cl. 383-14.000.
Strauss, Udo: *See—*
Breidenbach, Heribert; and Strauss, Udo, 4,509,437, Cl. 110-345.000.
Stroffolino, Leon C., to Paolantonio, Vito J. Umbrella silk screening fixture. 4,509,420, Cl. 101-35.000.
Strothers, John. Vehicle seat harness. 4,509,798, Cl. 297-487.000.
Struthers, Ralph C. Fuel cell electrolyte supply system and apparatus. 4,510,211, Cl. 429-18.000.
Stryker Corporation: *See—*
Richmond, James W., 4,509,516, Cl. 128-303.00R.
Stuart, Thomas G., to Applied Power Inc. Latch mechanism for a tilt-cab truck. 4,509,612, Cl. 180-89.140.
Stucke, Walter, to Mannesmann AG. Method of jacketing steel pipes. 4,510,007, Cl. 156-244.120.
Stumpp, Gerhard: *See—*
Kull, Hermann; Wessel, Wolf; and Stumpp, Gerhard, 4,509,480, Cl. 123-359.000.
Stutzinger, Ferdinand: *See—*
Bottcher, Wolfgang; Juttner, Heinz; Maurer, Albrecht; and Stutzinger, Ferdinand, 4,509,295, Cl. 51-49.000.
Suciu, George D.; Stefani, Giancarlo; and Fumagalli, Carlo, to Lummus Company, The. Catalysts containing mixed oxides of vanadium and phosphorus. 4,510,258, Cl. 502-209.000.
Suda, Yoshiyuki; Yokoyama, Katsunori; and Tanuma, Chiaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Piezoelectric displacing device. 4,510,412, Cl. 310-328.000.
Suga, Tetsuo: *See—*
Kobayashi, Minoru; Sakai, Yoshiya; Minato, Shoji; Ooe, Tsuguo; Arai, Katsumi; and Suga, Tetsuo, 4,510,374, Cl. 219-146.100.
Sugihara, Taisuke: *See—*
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; Sugihara, Taisuke; Takagi, Seiji; and Sako, Kiyohide, 4,510,307, Cl. 544-283.000.
Sugimoto, Akinori; and Sugimoto, Hiroshi, to Mitsubishi Denki Kabushiki Kaisha. Electric dynamometer. 4,509,374, Cl. 73-862.170.
Sugimoto, Hiroshi: *See—*
Sugimoto, Akinori; and Sugimoto, Hiroshi, 4,509,374, Cl. 73-862.170.
Sugimura, Nobuyuki. Accumulator. 4,509,557, Cl. 138-30.000.
Sugita, Naoki: *See—*
Masuda, Senichi; and Sugita, Naoki, 4,509,958, Cl. 55-132.000.
Sugita, Yutaka: *See—*
Takeshita, Masatoshi; Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,510,231, Cl. 430-312.000.
Sugiyama, Hiroyuki, to Victor Company of Japan, Ltd. Rotary recording medium and reproducing apparatus thereof. 4,510,531, Cl. 358-342.000.
Sugizaki, Takashi; and Sakamoto, Yoshisuke, to Toyo Seikan Kaisha, Ltd. Squeezable container for dispensing foamed sol. 4,509,661, Cl. 222-190.000.
Suhr, Heinz P.: *See—*
Wiesmann, Herbert L.; and Suhr, Heinz P., 4,509,793, Cl. 297-355.000.
Sulzer-Escher Wyss GmbH: *See—*
Wuhrer, Wolfgang, 4,509,925, Cl. 440-67.000.
Sumansky, L. Walter, to United States Steel Corporation. Cleaning method for removing sulfur containing deposits from coke oven gas lines. 4,509,989, Cl. 134-22.120.
Sumida, Takenori: *See—*
Miura, Yoshikazu; Horimoto, Koji; and Sumida, Takenori, 4,510,273, Cl. 523-406.000.
Sumitomo Chemical Company, Limited: *See—*
Hattori, Makoto; Taguma, Akihiro; and Takeshita, Akira, 4,510,087, Cl. 260-371.000.
Saito, Kenji; and Yamachika, Hiroshi, 4,510,329, Cl. 568-310.000.
Sumitomo, Hiroyuki: *See—*
Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, 4,509,592, Cl. 165-166.000.
Sumiya, Koji; and Kuramochi, Kojiro, to Aisin Warner Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha. Hydraulic pressure regulating system for a vehicle automatic transmission. 4,509,391, Cl. 74-869.000.
Summers, Mark A.; Eimerl, David; and Boyd, Robert D., to United States of America, Energy. Optical harmonic generator. 4,510,402, Cl. 307-427.000.
Sumpter, Irvin L.: *See—*
Peters, Donald L.; Rathman, John R.; and Sumpter, Irvin L., 4,510,116, Cl. 264-529.000.
Sun, Shan C., to Westinghouse Electric Corp. Frequency modulation or pulse modulation demodulator. 4,510,453, Cl. 329-106.000.
Sun Tech, Inc.: *See—*
Stenger, Richard J., 4,509,821, Cl. 350-96.230.
Sunakawa, Makoto: *See—*
Okuno, Toshimitsu; Hori, Yutaka; Sunakawa, Makoto; and Inagaki, Sadayuki, 4,510,181, Cl. 427-142.000.
Sund, Rune: *See—*
Wallqvist, Sven; and Sund, Rune, 4,510,379, Cl. 235-95.00C.
Sutton, John R., to Marine Concepts, Inc. Drydocking device having a moment resisting arrangement. 4,509,446, Cl. 114-45.000.
Suzuki, Akio; Akiyama, Mitsuo; Uzuhashi, Hideo; Ochiai, Izumi; Yamashita, Hitoshi; Sekine, Youji; Matsui, Katsuo; and Tomita, Syuji, to Hitachi, Ltd. Method of manufacturing fan guard. 4,509,354, Cl. 72-294.000.
Suzuki, Minoru: *See—*
Mori, Kenzo; Yasuda, Hyo; and Suzuki, Minoru, 4,510,498, Cl. 343-435.000.
Suzuki, Ryo: *See—*
Takeshita, Masatoshi; Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,510,231, Cl. 430-312.000.
Suzuki, Yasuo: *See—*
Yomogida, Toshihiko; Suzuki, Yasuo; and Ito, Kyoji, 4,510,580, Cl. 364-900.000.
Svengren, Anders G., to Nestec S.A. Method of and a machine for disintegrating materials. 4,509,700, Cl. 241-280.000.
Svetlik, Harvey E., to Phillips Petroleum Company. Heat transfer device and method of manufacture. 4,509,590, Cl. 165-104.270.
Swann, David A.: *See—*
Donahoe, Patricia K.; Budzik, Gerald P.; and Swann, David A., 4,510,131, Cl. 424-105.000.

Swanson, Hilmer I., to Harris Corporation. PDM Amplifier having distortion reduction circuit. 4,510,456, Cl. 330-10.000.
Swartz, Raymond K.: *See*—
Bursh, Talmage P., Jr.; Davis, Dean I.; Slominski, John T.; and Swartz, Raymond K., 4,510,346, Cl. 174-36.000.
Sweet, Welby C., to Marathon Oil Company. Process for devolatilizing natural gas liquids. 4,509,967, Cl. 62-17.000.
Swiderski, Paul R.: *See*—
Blevins, Theodore J.; and Swiderski, Paul R., 4,509,216, Cl. 5-13.000.
Swift, Joseph E. Continuous flow fuel injection system. 4,509,486, Cl. 123-453.000.
Swift, Stephen: *See*—
Money, David K.; Swift, Stephen; MacLaurin, Andrew; and Frost, John G., 4,509,529, Cl. 128-708.000.
Swisher, Steven L.: *See*—
Councilman, Richard R.; Swisher, Steven L.; and Carpenter, Robert L., 4,509,705, Cl. 242-84.21R.
SWS Silicones Corporation: *See*—
Sanders, Albert J., Jr.; and Larson, Michael J., 4,509,981, Cl. 106-3.000.
Syrbius, Gerhard: *See*—
Koch, Klaus; Schaeffer, Hans-Joachim; and Syrbius, Gerhard, 4,509,419, Cl. 100-117.000.
Syuto, Sadanobu: *See*—
Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; Toya, Ichizo; and Syuto, Sadanobu, 4,510,235, Cl. 430-574.000.
Szabo, Ervin I.; and Whiting, Laurence V., to Canadian Patents and Development Limited. Method of manufacturing a foundry mould mix containing a mould binder. 4,509,983, Cl. 106-38.200.
Szantho, Charles F.; and Riordan, Edward D., to Joyal Products, Inc. Fusing machine. 4,510,370, Cl. 219-86.250.
Szczepanek, Thaddeus J., to Universal Tool Company, Inc. Handcuff lock construction. 4,509,346, Cl. 70-16.000.
Szenger, Franz: *See*—
Herzog, Klaus; and Szenger, Franz, 4,509,871, Cl. 384-502.000.
Szeto, Whalun: *See*—
Schlienger, Max P.; and Szeto, Whalun, 4,510,368, Cl. 219-69.00M.
Szikora, Bela: *See*—
Boday, Otto ; Herpay, Andras; Krajcsovics, Ferenc; Neveri, Istvan; Pete, Sandor; Pocsy, Ferenc; Szikora, Bela; and Szirmai, Endre, 4,509,434, Cl. 110-238.000.
Szirmai, Endre: *See*—
Boday, Otto ; Herpay, Andras; Krajcsovics, Ferenc; Neveri, Istvan; Pete, Sandor; Pocsy, Ferenc; Szikora, Bela; and Szirmai, Endre, 4,509,434, Cl. 110-238.000.
Szporny, Laszlo: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.
T. S. Simms & Co. Limited: *See*—
Allison, Philip J.; and Smith, Morley L., 4,509,226, Cl. 15-257.060.
Tabarelli, Werner; and Lobach, Ernst W. Apparatus for the photolithographic manufacture of integrated circuit elements. 4,509,852, Cl. 355-30.000.
Tabata, Akira: *See*—
Goto, Hiroshi; and Tabata, Akira, 4,509,249, Cl. 29-576.00W.
Tabata, George K.; and Yardy, Raymond, to Discovision Associates. Signal conditioning method and apparatus for FM code signal. 4,510,536, Cl. 360-65.000.
Tabata, Itsuo; and Watanabe, Seiichi, to Denki Kagaku Kogyo Kabushiki Kaisha. Process for producing chloroprene. 4,510,341, Cl. 570-229.000.
Tabet, Michael A. Golfer's wind indicator and ball retriever. 4,509,751, Cl. 273-32.00H.
Tachikawa Spring Co., Ltd.: *See*—
Takagi, Genjiro, 4,509,796, Cl. 297-452.000.
Tachiki, Masaaki: *See*—
Horike, Masanori; Furukawa, Tatsuya; Sekiya, Takuro; Ebi, Yutaka; Isayama, Takuro; and Tachiki, Masaaki, 4,510,509, Cl. 346-140.00R.
Taguchi, Keiji: *See*—
Hachisu, Takeshi; Taguchi, Keiji; Sasaki, Toshimi; Matsumoto, Tetsuo; and Hidao, Nobuyoshi, 4,509,995, Cl. 148-143.000.
Taguma, Akihiro: *See*—
Hattori, Makoto; Taguma, Akihiro; and Takeshita, Akira, 4,510,087, Cl. 260-371.000.
Tahara, Iwao, to Casio Computer Co., Ltd. Sound generating device for jogger. 4,510,485, Cl. 340-323.00R.
Taiho Kogyo Co., Ltd.: *See*—
Takenaka, Akira; Shimasaki, Keiichi; and Kuwazuru, Yasumitsu, 4,509,803, Cl. 308-5.00R.
Taiyo Musen Co. Ltd.: *See*—
Mori, Kenzo; Yasuda, Hyo; and Suzuki, Minoru, 4,510,498, Cl. 343-435.000.
Taiyo Yuden Kabushiki Kaisha: *See*—
Iida, Hideyo; Kato, Koumei; Mishuku, Toshio; and Fujimaki, Yukiko, 4,510,195, Cl. 428-215.000.
Tajana, Alberto: *See*—
Nardi, Dante; Catto, Alberto; Tajana, Alberto; Cazzulani, Pietro; and Graziani, Gabriele, 4,510,140, Cl. 544-360.000.
Takagi, Genjiro, to Tachikawa Spring Co., Ltd. Seat frame for vehicle seat. 4,509,796, Cl. 297-452.000.
Takagi, Seiji: *See*—
Hidaka, Hiroyoshi; Sone, Takanori; Sasaki, Yasuharu; Sugihara, Taisuke; Takagi, Seiji; and Sako, Kiyohide, 4,510,307, Cl. 544-283.000.
Takagi, Tadao: *See*—
Hakamata, Kazuo; Takagi, Tadao; and Hyodo, Yukio, 4,510,411, Cl. 310-316.000.
Takagi, Yukio, to Meinan Machinery Works, Inc. Veneer splicing apparatus. 4,510,009, Cl. 156-353.000.
Takahashi, Hideaki: *See*—
Takeuchi, Takashi; Takahashi, Hideaki; Saji, Keiichi; Kondo, Haruyoshi; and Hayakawa, Kiyoharu, 4,510,036, Cl. 204-425.000.
Takahashi, Minoru, to TDK Corporation. LC-switched transistor oscillator for vibrator excitation. 4,510,464, Cl. 331-116.00R.
Takahashi, Toshio, to Fuji Jukogyo Kabushiki Kaisha. System for diagnosing a device of an internal combustion engine. 4,509,363, Cl. 73-118.000.
Takano, Hiroshi; Yokoyama, Hiroshi; and Mizuno, Takahide, to Mitsuboshi Belting Ltd. Belt sleeve manufacturing method and apparatus. 4,510,113, Cl. 264-257.000.
Takao, Mitsunori; and Kimura, Takahiko, to Nippondenso Co., Ltd. Idle operation control for internal combustion engines. 4,509,477, Cl. 123-339.000.
Takao, Mitsunori; and Ban, Toshika, to Nippondenso Co., Ltd. A/D Conversion period control for internal combustion engines. 4,510,569, Cl. 364-431.120.
Takaya, Yoshikazu: *See*—
Tsubai, Yasuo; Takaya, Yoshikazu; and Kanada, Eiji, 4,510,228, Cl. 430-204.000.
Takeda Chemical Industries, Ltd.: *See*—
Kawaguchi, Toshihiro; Ishizaka, Mineo; and Doi, Hiyoshi, 4,509,568, Cl. 141-129.000.
Ochiai, Michihiko; Morimoto, Akira; and Matsushita, Yoshihiro, 4,510,138, Cl. 514-206.000.
Takeda, Masaru: *See*—
Kawahara, Masakatsu; and Takeda, Masaru, 4,509,404, Cl. 91-388.000.
Takeda, Shiro; and Nakajima, Minoru, to Fujitsu Ltd. Silicone-type coating resin solution. 4,510,283, Cl. 524-356.000.
Takei, Haruo: *See*—
Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; Toya, Ichizo; and Syuto, Sadanobu, 4,510,235, Cl. 430-574.000.
Takemae, Mikio: *See*—
Maida, Osamu; Takemae, Mikio; and Okubo, Yuji, 4,509,847, Cl. 354-442.000.
Takematsu, Yoshiyuki, to Fuji Koeki Kabushiki Kaisha. Photometric circuit in a photographic flash device. 4,509,844, Cl. 354-416.000.
Takematsu, Yoshiyuki, to Fuji Koeki Kabushiki Kaisha, a part interest. Grip-type photographic flash discharge device. 4,510,419, Cl. 315-241.00P.
Takenaka, Akira; Shimasaki, Keiichi; and Kuwazuru, Yasumitsu, to Taiho Kogyo Co., Ltd. Sliding member having a novel pore structure on the sliding surface thereof. 4,509,803, Cl. 308-5.00R.
Takeshita, Akira: *See*—
Hattori, Makoto; Taguma, Akihiro; and Takeshita, Akira, 4,510,087, Cl. 260-371.000.
Takeshita, Masatoshi; Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, to Hitachi, Ltd. Method for manufacturing a magnetic bubble memory. 4,510,231, Cl. 430-312.000.
Takeuchi, Hisaharu: *See*—
Miyaguchi, Hiroshi; and Takeuchi, Hisaharu, 4,510,578, Cl. 364-725.000.
Takeuchi, Koichi: *See*—
Sato, Seiji; and Takeuchi, Koichi, 4,510,538, Cl. 360-84.000.
Takeuchi, Takashi; Takahashi, Hideaki; Saji, Keiichi; Kondo, Haruyoshi; and Hayakawa, Kiyoharu, to Kabushiki Kaisha Toyota Chouo Kenkyusho. Limiting electric current type oxygen sensor with heater and limiting electric current type oxygen concentration detecting device using the same. 4,510,036, Cl. 204-425.000.
Takeuchi, Teruaki: *See*—
Takeshita, Masatoshi; Kodama, Naoki; Suzuki, Ryo; Takeuchi, Teruaki; and Sugita, Yutaka, 4,510,231, Cl. 430-312.000.
Takeuchi, Tooru; Nakamura, Masaru; and Aoishi, Eiji, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Polyvinyl chloride resinous molded sheet product. 4,510,201, Cl. 428-285.000.
Taki, Hiromitsu: *See*—
Honjo, Katsuhiko; Taki, Hiromitsu; and Sato, Noriya, 4,510,179, Cl. 427-96.000.
Taki, Kiyozi, to Kabushiki Kaisha Miura Kumihimo Kogyo. Plastic slide bearing. 4,509,870, Cl. 384-296.000.
Takizawa, Yoshiyuki: *See*—
Sato, Tetsuo; Kominami, Yasuo; Takizawa, Yoshiyuki; and Haeno, Akira, 4,510,458, Cl. 330-260.000.
Talavera Corporation: *See*—
Talavera, Victor T., 4,509,725, Cl. 254-212.000.
Talavera, Victor T., to Talavera Corporation. Carpet repair mechanism. 4,509,725, Cl. 254-212.000.
Talbot, Christopher G.: *See*—
Grimbleby, James B.; and Talbot, Christopher G., 4,510,384, Cl. 250-201.000.
Tamai, Masayoshi; Iyoda, Tetsuo; and Koizumi, Yukihisa, to Fuji Xerox Co., Ltd. Method and device for detecting deflection amount of ink jet in ink jet printer. 4,510,504, Cl. 346-75.000.
Tamai, Yasuo: *See*—
Ogawa, Hiroshi; Mizuno, Chiaki; and Tamai, Yasuo, 4,510,203, Cl. 428-425.900.

Tamiya, Yoshimichi; and Eguchi, Yasukata, to Janome Sewing Machine Co. Ltd. Sewing machine with an automatic buttonhole stitching device. 4,509,441, Cl. 112-158.00B.

Tamura, Hifumi: *See*—
Izumi, Eiichi; and Tamura, Hifumi, 4,510,387, Cl. 250-309.000.

Tamura, Kouji: *See*—
Matsuoka, Hiroo; Matsuoka, Seiichi; Yamabe, Tsunekichi; Fujie, Hirokazu; Mori, Kenji; Tamura, Kouji; Yamada, Masatoshi; and Furuta, Akio, 4,510,264, Cl. 502-328.000.

Tamura, Masuhiko: *See*—
Matsumoto, Mitsuo; Yoshimura, Noriaki; and Tamura, Masuhiko, 4,510,332, Cl. 568-454.000.
Yoshimura, Noriaki; and Tamura, Masuhiko, 4,510,331, Cl. 568-450.000.

Tamura, Yoshiharu, to NEC Corporation. Output power control circuit for power amplifier. 4,510,460, Cl. 330-285.000.

Tan, Yoichi, to Fuji Xerox Co., Ltd. Digital signal transmission system. 4,510,600, Cl. 370-94.000.

Tanabe, Kenzo; and Shimizu, Keiichiro, to Matsushita Electric Industrial Co., Ltd. Electronically controlled variable semiconductor resistor. 4,510,517, Cl. 357-34.000.

Tanaka Kogyo Company, Ltd.: *See*—
Ishida, Shigetoshi, 4,509,496, Cl. 123-651.000.

Tanaka, Masaaki: *See*—
Yagi, Shigenori; Kuzumoto, Masaki; Tanaka, Masaaki; and Ogawa, Shuji, 4,510,606, Cl. 372-25.000.

Tanaka, Tsuyoshi; and Yoshikawa, Kazuhisa, to Kabushiki Kaisha Kobe Seiko Sho. Compression crusher having an optimized jaw configuration. 4,509,699, Cl. 241-268.000.

Taniguchi, Nobuyuki; Ishikawa, Norio; Akada, Yasuaki; Egawa, Takeshi; and Kawamura, Kunio, to Minolta Camera Kabushiki Kaisha. Camera system capable of focus detection through an interchangeable objective lens. 4,509,842, Cl. 354-402.000.

Taniguchi, Nobuyuki: *See*—
Nakai, Masaaki; Sahara, Masayoshi; and Taniguchi, Nobuyuki, 4,509,846, Cl. 354-442.000.

Tanimoto, Masahiro: *See*—
Hosokawa, Yoshinori; Tanimoto, Masahiro; and Tsuji, Katsuya, 4,510,610, Cl. 373-118.000.

Tanno, Shogo, to Dainichi-Nippon Cables, Ltd. Apparatus for electrically testing multi-core cables. 4,510,435, Cl. 324-52.000.

Tanuma, Chiaki: *See*—
Suda, Yoshiyuki; Yokoyama, Katsunori; and Tanuma, Chiaki, 4,510,412, Cl. 310-328.000.

Tao, John C.: *See*—
Skinner, Ronald W.; Tao, John C.; and Znaimer, Samuel, 4,510,040, Cl. 208-10.000.

Tarayre, Jean-Pierre: *See*—
Cousse, Henry; Mouzin, Gilbert; Tarayre, Jean-Pierre; and Rieu, Jean-Pierre, 4,510,142, Cl. 514-255.000.

Tarbox, Gary L.: *See*—
Barnes, Stephen R.; Tarbox, Gary L.; Huntsman, Lee L.; and McLaren, Barry D., 4,509,526, Cl. 128-663.000.

Tassin, Myron J., Jr. Blood withdrawal apparatus and method of using same. 4,509,534, Cl. 128-764.000.

Tate, Harold, Jr.: *See*—
Cook, John, 4,510,358, Cl. 200-81.00R.

Taur, Yuan, to International Business Machines Corporation. Single mask process for fabricating CMOS structure. 4,509,991, Cl. 148-1.500.

Taus, Christian: *See*—
Rau, Willy; and Taus, Christian, 4,509,438, Cl. 111-13.000.

Taylor, Charles H.: *See*—
Merritt, Francis L.; and Taylor, Charles H., 4,510,377, Cl. 219-550.000.

Taylor, Lloyd D., to Polaroid Corporation. Polymerization of monomeric hydrogen-blocked oxime derivatives. 4,510,294, Cl. 525-369.000.

Taylor, Lyle H.; and Kasner, William H., to Westinghouse Electric Corp. Operation of a two-photon three level laser. 4,510,604, Cl. 372-4.000.

TDK Corporation: *See*—
Takahashi, Minoru, 4,510,464, Cl. 331-116.00R.

Teach, Eugene G.; and Springer, Jeffery T., to Stauffer Chemical Company. Meta-anilide and meta-anilide urea herbicidal compounds and methods of use. 4,509,975, Cl. 71-100.000.

Teasdale, Robert D.: *See*—
Bouvet, Jean; and Teasdale, Robert D., 4,509,509, Cl. 128-24.100.

Tebbe, Frederick N.: *See*—
Peet, William G.; and Tebbe, Frederick N., 4,510,327, Cl. 568-1.000.

Tech Development Inc.: *See*—
Linsker, Eugene, 4,509,896, Cl. 415-9.000.

Technion Research & Development Foundation, Ltd.: *See*—
Cais, Michael; and Shimoni, Moshe, 4,510,058, Cl. 210-657.000.

Tedder, Daniel W., to Georgia Tech Research Corporation. Process for producing fuel grade alcohol by solvent extraction and carrier gas stripping. 4,510,242, Cl. 435-157.000.

Tedesco, Jack, to Econolite Control Products, Inc. Power supply voltage monitor and control system. 4,510,549, Cl. 361-86.000.

Tektronix, Inc.: *See*—
Dagostino, Thomas P.; and Trudel, John D., 4,510,571, Cl. 364-487.000.
Dickes, Eric J.; Hill, Thomas C., III; and Flegal, Robert T., 4,510,461, Cl. 331-1.00A.
McClanahan, John B.; LaVoie, Marvin E.; Kelsoe, Wayne E.; and Wrobel, James, 4,510,482, Cl. 338-24.000.

Telectronics Pty. Ltd.: *See*—
Money, David K.; Swift, Stephen; MacLaurin, Andrew; and Frost, John G., 4,509,529, Cl. 128-708.000.

Teledyne Industries, Inc.: *See*—
Ward, John W., 4,509,531, Cl. 128-736.000.

Teleflex Incorporated: *See*—
Tschanz, August E.; and Geiger, Robert W., 4,509,387, Cl. 74-505.000.

Telefunken Electronic GmbH: *See*—
Minner, Willy; Krappel, Alfred; and Guggenmos, Johannes, 4,509,482, Cl. 123-418.000.

Tellert, Rudy, to Sachs-Systemtechnik GmbH. Automatic friction clutches and controls therefor. 4,509,625, Cl. 192-0.033.

Teng, Lin-nar L., to Research Corporation. Orally administered heparin. 4,510,135, Cl. 514-56.000.

Tennison, Stephen R.: *See*—
Joyner, Richard W.; McCarroll, John J.; and Tennison, Stephen R., 4,510,071, Cl. 252-373.000.

Terakura, Yukio: *See*—
Ikemoto, Kazuhito; Terakura, Yukio; Miyake, Takashi; and Yamamoto, Takashi, 4,509,381, Cl. 74-413.000.

Teraoka, Toru: *See*—
Yoshida, Kenji; Nakazawa, Makoto; Shike, Toyohiko; Tomida, Masayuki; Tsuda, Masataka; and Teraoka, Toru, 4,510,154, Cl. 514-365.000.

Terasawa, Koji, to Canon Kabushiki Kaisha. Inkjet printer. 4,510,510, Cl. 346-140.00R.

Terashima, Masayuki: *See*—
Ashikaga, Tadashi; and Terashima, Masayuki, 4,510,430, Cl. 318-800.000.

Terumo Kabushiki Kaisha: *See*—
Hanzawa, Yoshiki, 4,509,943, Cl. 604-31.000.

Texaco Inc.: *See*—
Chou, Kechia J.; and Valkovich, Phillip B., 4,510,063, Cl. 252-51.50R.
Lambert, Clifford L., Jr.; and Duranleau, Roger G., 4,510,326, Cl. 564-132.000.
Rowe, Edward H.; and Parcell, Lloyd J., 4,510,057, Cl. 210-612.000.

Texor Corporation: *See*—
Aggeler, Michael J., 4,510,542, Cl. 360-98.000.

Textile Products, Incorporated: *See*—
Rheaume, Walter A., 4,510,198, Cl. 428-246.000.

Textilma AG: *See*—
Speich, Francisco, 4,509,380, Cl. 74-394.000.

Tezuka, Nobuo, to Canon Kabushiki Kaisha. Spring installing device. 4,509,240, Cl. 29-227.000.

Thallmeier, Manfred: *See*—
Glembin, Dirk; Huhn, Kurt; Meyer, Gunter; and Thallmeier, Manfred, 4,510,334, Cl. 568-643.000.

Therrien, Gaston, to Bertec Inc. Guardrail assembly for hospital bed. 4,509,217, Cl. 5-430.000.

Thibodeaux, Emile; and Thibodeaux, Robert. Rig piling clamp apparatus. 4,509,883, Cl. 405-232.000.

Thibodeaux, Robert: *See*—
Thibodeaux, Emile; and Thibodeaux, Robert, 4,509,883, Cl. 405-232.000.

Thomas, Rudy V., to Allied Corporation. Safety belt system with tension eliminating mechanism. 4,509,706, Cl. 242-107.40A.

Thomasson, William R., to Coles Cranes Limited. Safe load indicator. 4,509,376, Cl. 73-862.560.

Thompson, John A., to Exxon Research and Engineering Co. Selective extraction solvent recovery using regenerated cellulose membrane under reverse osmosis conditions. 4,510,047, Cl. 208-321.000.

Thompson, Lance R.: *See*—
Collins, George J.; Thompson, Lance R.; Rocca, Jorge J.; and Boyer, Paul K., 4,509,451, Cl. 118-50.100.

Thompson, Mortimer S., to Tri-Tech Systems International Inc. Multicontainer carrier package and a method of assembly therefor. 4,509,639, Cl. 206-159.000.

Thompson, Sharon E.; and Eastmond, Bruce C., to Motorola, Inc. Noise blanking arrangement to minimize blanker splatter. 4,510,624, Cl. 455-223.000.

Thomson - CSF: *See*—
Arditty, Herve; Bourbin, Yannic; Dubos, Jacques; Gautnier, Francis; and Graindorge, Philippe, 4,509,968, Cl. 65-10.100.
Caugant, Jean; and Dale, Jacques, 4,510,613, Cl. 378-152.000.
Grall, Georges; Joseph, Jacques; and Lemoine, Claude, 4,510,586, Cl. 367-87.000.
Resneau, Jean C.; Puyhaubert, Jean; Da Silva, Evelyne; and Lamontagne, Claude, 4,510,470, Cl. 333-142.000.

3-J-Co., Inc.: *See*—
Bennett, Jackie D.; Bennett, Johnnie R.; and Bennett, Jimmie D., Jr., 4,509,536, Cl. 130-30.00R.

Thuot, Michael E.: *See*—
Longmire, Jerry L.; Thuot, Michael E.; and Warren, David S., 4,510,451, Cl. 328-130.100.

Ti Russel Hobbs Limited: *See*—
Inskip, Michael; and Warren, Alan, 4,510,375, Cl. 219-328.000.

Tihanyi, Bela: *See*—
Cornils, Boy; Tihanyi, Bela; Weber, Jurgen; DeWin, Werner; Erben, Edwin; and Muhlratzer, August, 4,510,182, Cl. 427-162.000.

Timex Medical Products Corporation: *See*—
Fraden, Jacob, 4,509,527, Cl. 128-671.000.
Timmington, David A. Chains. 4,510,032, Cl. 204-197.000.
Tinti, Maria O.; Quaresima, Emma; Bagolini, Carlo; and de Witt, Paolo, to Sigma-Tau Industrie Farmaceutiche Riunite S.p.A. Dithiodiacyl carnitines. 4,510,318, Cl. 560-147.000.
Tobacco Research & Development Institute Limited: *See*—
Meiring, Willem J., 4,509,609, Cl. 177-1.000.
Tobert, Jonathan A.: *See*—
Blaine, Edward H.; Cragoe, Edward J., Jr.; Hirschmann, Ralph F.; Nancarrow, John F., deceased; Nancarrow, Elisabeth M., executrix; and Tobert, Jonathan A., 4,510,322, Cl. 514-255.000.
Tobin-Arp Manufacturing Company: *See*—
Flaten, James F., 4,509,267, Cl. 33-185.00R.
Tokai Shoji Co. Ltd.: *See*—
Shirataki, Kenji, 4,509,455, Cl. 118-696.000.
Tokumitsu, Junsuke, to Victor Company of Japan, Ltd. Video insert editing with control signals derived off tape or from the insert. 4,510,535, Cl. 360-14.200.
Tokusen Kogyo Kabushiki Kaisha: *See*—
Yoneda, Osamu, 4,509,318, Cl. 57-212.000.
Tokuyama, Yoshio, to Victor Company of Japan, Ltd. System for reproducing a video signal in a slow motion or still picture reproduction. 4,510,533, Cl. 360-10.200.
Tokyo Electric Co., Ltd.: *See*—
Hira, Yutaka; Ukai, Yoshitaka; Akuzawa, Yoshihide; Aoki, Osamu; and Shimatani, Saburo, 4,509,874, Cl. 400-691.000.
Tokyo Sanyo Electric Co., Ltd.: *See*—
Sato, Takehisa, 4,510,563, Cl. 363-20.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Fukatsu, Kunio, 4,510,381, Cl. 235-379.000.
Kurokawa, Koji, 4,509,739, Cl. 271-176.000.
Miyaguchi, Hiroshi; and Takeuchi, Hisaharu, 4,510,578, Cl. 364-725.000.
Nagano, Katsumi, 4,510,486, Cl. 340-347.0DA.
Nakagome, Hideki; and Yasuda, Satoshi, 4,509,334, Cl. 62-6.000.
Odawara, Masachika, 4,509,900, Cl. 416-198.00A.
Ogura, Masahiko, 4,510,422, Cl. 318-254.000.
Sasaki, Takafumi, 4,509,779, Cl. 292-254.000.
Seo, Yasutsugu, 4,509,525, Cl. 128-663.000.
Suda, Yoshiyuki; Yokoyama, Katsunori; and Tanuma, Chiaki, 4,510,412, Cl. 310-328.000.
Tsujii, Tatsuo; and Okino, Takaaki, 4,510,577, Cl. 364-563.000.
Tom David, Inc.: *See*—
David, Tom, 4,509,698, Cl. 241-169.100.
Tomida, Masayuki: *See*—
Yoshida, Kenji; Nakazawa, Makoto; Shike, Toyohiko; Tomida, Masayuki; Tsuda, Masataka; and Teraoka, Toru, 4,510,154, Cl. 514-365.000.
Tomiguchi, Akihiko: *See*—
Yoshida, Tatsuo; Fukuda, Kikuo; and Tomiguchi, Akihiko, 4,509,319, Cl. 57-218.000.
Tomita, Hitoshi: *See*—
Ochiai, Kouji; and Tomita, Hitoshi, 4,509,492, Cl. 123-569.000.
Tomita, Syuji: *See*—
Suzuki, Akio; Akiyama, Mitsuo; Uzuhashi, Hideo; Ochiai, Izumi; Yamashita, Hitoshi; Sekine, Youji; Matsui, Katsuo; and Tomita, Syuji, 4,509,354, Cl. 72-294.000.
Tomite, Tosio, to Hitachi, Ltd. Permanent magnet type motor having improved pole structure. 4,510,407, Cl. 310-154.000.
Tomizawa, Hiroshi: *See*—
Mizokawa, Sadao; Hamada, Takuji; Tomizawa, Hiroshi; and Fushimi, Hitoshi, 4,510,494, Cl. 340-825.050.
Tonnius, Dietrich; Weiss, Wolfgang; Orth, Winfried; Miele, Heinrich; and Pastorek, Emmerich, to Rutgerswerke Aktiengesellschaft. Method for the production of phenanthrenequinone. 4,510,090, Cl. 260-396.00R.
Tonokawa, Hiroshi; and Nakamura, Masao, to Dow Chemical Company, The. Directional flexibilization of expanded thermoplastic foam sheet for low temperature insulation. 4,510,268, Cl. 521-146.000.
Toomey, Robert D.: *See*—
Neelameggham, Ramaswami; Priscu, John C.; and Toomey, Robert D., 4,510,029, Cl. 204-130.000.
Toray Industries, Inc.: *See*—
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, 4,509,321, Cl. 57-328.000.
Tork, Leo: *See*—
Kolb, Gunter, deceased; Tork, Leo; and Hohne, Wolfgang, 4,510,302, Cl. 526-264.000.
Torkelson, John: *See*—
LeBrun, Thomas Q.; Torkelson, John; Dempster, Roy E.; and Van Tyne, Richard G., 4,510,619, Cl. 382-57.000.
Torley, Jozsef: *See*—
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.
Tosco Corporation: *See*—
Carlson, Franklin B.; and Hall, Robert N., 4,509,589, Cl. 165-95.000.
Toshiba Ceramics Co., Ltd.: *See*—
Kagami, Toshiro; and Watanabe, Kuniaki, 4,510,191, Cl. 428-36.000.
Toshiba Kikai Kabushiki Kaisha: *See*—
Morita, Seiichiro; Yuasa, Akihiko; and Arai, Takao, 4,509,236, Cl. 29-26.00A.
Nakamura, Hiromi; Mochizuki, Zenichi; Motomura, Noriyuki; and Yamada, Sadayoshi, 4,510,371, Cl. 219-121.0LM.
Toshinai, Akio: *See*—
Fujino, Sigeo; Hase, Takashi; and Toshinai, Akio, 4,510,414, Cl. 313-468.000.
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, to Richter Gedeon Vegyeszeti Gyar Rt. Resorcin derivatives, process for their preparation and pharmaceutical compositions containing them. 4,510,338, Cl. 568-766.000.
Toulhoat, Herve ; Plumail, Jean-Claude; Mercier, Marc; and Jacquin, Yves, to Ste Francaise des Products pour Catalyse Pro-Catalyse chez Institut Francais du Petrole. Process for manufacturing a supported catalyst for the hydrotreatment of hydrocarbon oils. 4,510,255, Cl. 502-10.000.
Toulhoat, Herve : *See*—
Billon, Alain; Jacquin, Yves; Peries, Jean-Pierre; and Toulhoat, Herve , 4,510,042, Cl. 208-59.000.
Tout, Nigel R.; and Hanson, Raymond, to USM Corporation. Treatment of articles having a coating of a moisture-curable composition. 4,509,271, Cl. 34-12.000.
Towart, Robertson: *See*—
Wehinger, Egbert; Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Towart, Robertson; Stoepel, Kurt; and Kazda, Stanislay, 4,510,310, Cl. 546-321.000.
Towmotor Corporation: *See*—
Reeves, Jerry L., 4,509,409, Cl. 92-80.000.
Toya, Ichizo: *See*—
Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; Toya, Ichizo; and Syuto, Sadanobu, 4,510,235, Cl. 430-574.000.
Toyama, Tatsuro: *See*—
Yuhara, Akitsuna; Nate, Kazuo; Toyama, Tatsuro; and Yamada, Jun, 4,510,410, Cl. 310-313.00D.
Toyo Aluminium Kabushiki Kaisha: *See*—
Mehada, Masashi; Yoshimura, Shozo; Yamaguchi, Kenshiro; and Iwao, Osamu, 4,510,207, Cl. 428-607.000.
Toyo Kogo Co., Ltd.: *See*—
Hattori, Toshihiko; Akagi, Yuji; and Kohara, Hideo, 4,509,906, Cl. 418-152.000.
Toyo Seikan Kaisha, Ltd.: *See*—
Sugizaki, Takashi; and Sakamoto, Yoshisuke, 4,509,661, Cl. 222-190.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Sakamoto, Shinichiro, 4,509,235, Cl. 29-26.00A.
Yomogida, Toshihiko; Suzuki, Yasuo; and Ito, Kyoji, 4,510,580, Cl. 364-900.000.
Toyota Jidosha Kabushiki Kaisha: *See*—
Ikemoto, Kazuhito; Terakura, Yukio; Miyake, Takashi; and Yamamoto, Takashi, 4,509,381, Cl. 74-413.000.
Inui, Masaki; and Yasui, Yasuyoshi, 4,509,385, Cl. 74-477.000.
Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, 4,510,396, Cl. 290-30.00R.
Toyota Jidosha Kogyo Kabushiki Kaisha: *See*—
Sumiya, Koji; and Kuramochi, Kojiro, 4,509,391, Cl. 74-869.000.
Tracer Technologies, Inc.: *See*—
Crouse, Dennis N.; Reynolds, James C.; and Walsh, Fraser M., 4,510,214, Cl. 429-43.000.
Trainor, Lawrence W., deceased: *See*—
Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased, 4,510,048, Cl. 209-3.000.
Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased, 4,510,049, Cl. 209-3.000.
Trainor, Marie L., executor: *See*—
Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased, 4,510,049, Cl. 209-3.000.
Trainor, Marie L., executrix: *See*—
Mai, Anh; Kaczynski, Donald J.; and Trainor, Lawrence W., deceased, 4,510,048, Cl. 209-3.000.
Transformatoren Union Aktiengesellschaft: *See*—
Broszat, Gottfried, 4,510,475, Cl. 336-60.000.
Transpec, Inc.: *See*—
Manning, Donald L., 4,509,782, Cl. 293-121.000.
Traver, Jack L.; Palmer, C. Dale; and Hughes, Richard, to Traver Tool Company. Downhole mobility and propulsion apparatus. 4,509,593, Cl. 166-63.000.
Traver Tool Company: *See*—
Traver, Jack L.; Palmer, C. Dale; and Hughes, Richard, 4,509,593, Cl. 166-63.000.
Treadwell, Stephen S.: *See*—
Martell, Charles R.; Leslie, Elmer N.; and Treadwell, Stephen S., 4,509,443, Cl. 112-262.100.
Trenkle, Robert W.: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,510,340, Cl. 568-884.000.
Tri-Tech Systems International Inc.: *See*—
Thompson, Mortimer S., 4,509,639, Cl. 206-159.000.
Trotter, Lamar S. Portable washing and spray assembly. 4,509,545, Cl. 134-199.000.
Trout, John F.; and Hoffman, John J., to Lily Corporation. Injection nozzle for adhesive materials. 4,509,884, Cl. 405-269.000.
Trubiano, Paolo C.: *See*—
Lenchin, Julianne M.; Trubiano, Paolo C.; and Hoffman, Stella, 4,510,166, Cl. 426-565.000.

Trudel, John D.: *See*—
Dagostino, Thomas P.; and Trudel, John D., 4,510,571, Cl. 364-487.000.

Tsang, Floris Y.: *See*—
Damrow, Paul A.; and Tsang, Floris Y., 4,509,254, Cl. 29-623.500.

Tschanz, August E.; and Geiger, Robert W., to Teleflex Incorporated. Actuator assembly for remotely controlling a valve. 4,509,387, Cl. 74-505.000.

Tsiriggakis, Theodoros, to Greek Powder and Cartridge Co., S.A. Differential gear. 4,509,388, Cl. 74-650.000.

Tsubai, Yasuo; Takaya, Yoshikazu; and Kanada, Eiji, to Mitsubishi Paper Mills, Ltd. Lithographic printing plate with gelatin layers having pH values below isoelectric point. 4,510,228, Cl. 430-204.000.

Tsuda, Masataka: *See*—
Yoshida, Kenji; Nakazawa, Makoto; Shike, Toyohiko; Tomida, Masayuki; Tsuda, Masataka; and Teraoka, Toru, 4,510,154, Cl. 514-365.000.

Tsuji, Katsuya: *See*—
Hosokawa, Yoshinori; Tanimoto, Masahiro; and Tsuji, Katsuya, 4,510,610, Cl. 373-118.000.

Tsujii, Tatsuo; and Okino, Takaaki, to Tokyo Shibaura Denki Kabushiki Kaisha. Non-contact radiation thickness gauge. 4,510,577, Cl. 364-563.000.

Tsukaya, Takashi, to Olympus Optical Co., Ltd. Endoscope system. 4,509,508, Cl. 128-6.000.

Tsutsumi, Hisao; and Inoue, Tomoko, to Kao Corporation. Emulsifying composition. 4,510,070, Cl. 252-351.000.

Tsuyama Mfg. Co., Ltd.: *See*—
Tsuyama, Sadaharu, 4,510,557, Cl. 362-188.000.

Tsuyama, Sadaharu, to Tsuyama Mfg. Co., Ltd. Headlamp device for bicycle, motorcycle and the like. 4,510,557, Cl. 362-188.000.

Tucci, James M.: *See*—
Eineichner, Donald E.; Chandra, Rangasami S.; and Tucci, James M., 4,509,365, Cl. 73-151.000.

Tufco Corporation: *See*—
Densmore, John C.; and Watkins, Charles W., 4,509,439, Cl. 112-79.00R.

Tulin Corporation: *See*—
Squire, John S., 4,510,429, Cl. 318-696.000.

Tullos, Homan C.; and Woods, Dewey W., to Kelly Bushing Tools, Inc. Wireline protector with improved clamping mechanism. 4,509,605, Cl. 175-57.000.

Tunoda, Kikuo: *See*—
Ozaki, Kiyomi; and Tunoda, Kikuo, 4,509,704, Cl. 242-84.20A.

Turley, Bernard C.: *See*—
Martin, Robert J.; Cisko, Lawrence W.; and Turley, Bernard C., 4,510,033, Cl. 204-245.000.

Turley, Stephen E. H.: *See*—
Greene, Peter D.; and Turley, Stephen E. H., 4,509,996, Cl. 148-171.000.

Turnbow, Garry V.: *See*—
Hartmann, Philip W.; Kohs, Dwight W.; Spencer, Douglas A.; and Turnbow, Garry V., 4,510,596, Cl. 370-58.000.

Turnbull, Robert S., to C.W.F. Hamilton & Company Limited. Marine jet propulsion units. 4,509,923, Cl. 440-43.000.

Tweed, William J.: *See*—
Whittenburg, Stephen L.; McCormick, David D.; Tweed, William J.; Ozgunay, A. Aykut; and Williams, James T., 4,509,412, Cl. 99-331.000.

Tyson, Robert G.: *See*—
Albert, Alban I.; Ballenegger, Marc E.; Overeem, Jan C.; and Tyson, Robert G., 4,510,159, Cl. 514-456.000.

Ubert, Hans-Jurgen, to Claudius Peters AG. Device for removing grate screenings. 4,509,917, Cl. 432-75.000.

Ubukata, Susumu; Mizutani, Yasukazu; and Iyoda, Syozo, to Ubukata, Susumu. Snap action type thermally responsive switching structure. 4,510,481, Cl. 337-368.000.

Uchida, Isamu, deceased (by Uchida, Kazuko, heiress); by Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, to Laurel Bank Machine Co., Ltd. Automatic money receiving and disbursing machine. 4,510,380, Cl. 235-379.000.

Uchida, Kazuko, heiress: *See*—
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.

Uchida, Shigekatsu; Akatsuka, Takao; and Kawamura, Takahide, to Toyota Jidosha Kabushiki Kaisha. Method of controlling automatic stop and restart of an engine. 4,510,396, Cl. 290-30.00R.

Uchino, Shoichi: *See*—
Morishita, Hajime; Akagi, Motoo; Nonogaki, Saburo; Hayashi, Nobuaki; and Uchino, Shoichi, 4,510,226, Cl. 430-144.000.

Udovich, Carl A.; and Edwards, Robert C., to Standard Oil Company (Indiana). Catalysts for the production of maleic anhydride by the oxidation of butane. 4,510,259, Cl. 502-209.000.

Ufrecht, Martin; and Rest, Heinz, to Ford Motor Company. Vehicle door, in particular for passenger motor car. 4,509,293, Cl. 49-502.000.

Uhlig, Uwe: *See*—
Redeker, Werner; and Uhlig, Uwe, 4,509,892, Cl. 414-223.000.

Ukai, Takeshi: *See*—
Kanno, Tadaaki; Ukai, Takeshi; Akahoshi, Yutaka; and Shibata, Katsuji, 4,509,732, Cl. 270-37.000.

Ukai, Toshinao; Okazaki, Masaki; Takei, Haruo; Toya, Ichizo; and Syuto, Sadanobu, to Fuji Photo Film Co., Ltd. Silver halide photographic emulsions. 4,510,235, Cl. 430-574.000.

Ukai, Yoshitaka: *See*—
Hira, Yutaka; Ukai, Yoshitaka; Akuzawa, Yoshihide; Aoki, Osamu; and Shimatani, Saburo, 4,509,874, Cl. 400-691.000.

Ukima Colour & Chemicals Mfg. Co., Ltd.: *See*—
Kuriyama, Katsumi; Kondo, Isao; and Misaizu, Iwao, 4,510,186, Cl. 427-381.000.

Ulug, Mehmet E., to General Electric Company. Prioritized unidirectional distributed bus accessing system. 4,510,599, Cl. 370-85.000.

UNC Nuclear Industries, Inc.: *See*—
Boyce, William C.; Wittekind, Warren D.; Howard, Leroy C.; Hall, Thomas E.; and Lechelt, Wayne M., 4,510,573, Cl. 364-498.000.

Unimation, Inc.: *See*—
Dunne, Maurice J., 4,510,428, Cl. 318-632.000.

Union Carbide Corp.: *See*—
Mehta, Aspy K., 4,510,078, Cl. 252-510.000.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See*—
Cockayne, Brian; Griffiths, Richard J. M.; and Wright, Peter J., 4,509,997, Cl. 148-175.000.

United States of America
Air Force: *See*—
Kuperman, Gilbert G.; and Bodine, Fred R., 4,510,525, Cl. 358-88.000.
Merritt, Francis L.; and Taylor, Charles H., 4,510,377, Cl. 219-550.000.
Mori, Tsutomu T.; Dybdal, Robert B.; and Etcheverry, Robert D., 4,510,622, Cl. 455-67.000.
Army: *See*—
Brune, John F., 4,510,500, Cl. 343-708.000.
Caslavsky, Jaroslav L.; Lavoie, Gerald H.; Earle, William H.; and Viechnicki, Dennis J., 4,510,609, Cl. 373-110.000.
Energy: *See*—
Fraioli, Anthony V., 4,510,212, Cl. 429-30.000.
Gay, Don D., 4,509,855, Cl. 356-72.000.
George, E. Victor; and Schipper, John F., 4,510,605, Cl. 372-23.000.
Greenhalgh, Wilbur O., 4,509,978, Cl. 75-84.10R.
Horton, Joel R.; and Eissenberg, David M., 4,510,121, Cl. 422-232.000.
Lauf, Robert J., 4,510,112, Cl. 264-234.000.
Lee, Norman E., 4,509,856, Cl. 356-246.000.
Longmire, Jerry L.; Thuot, Michael E.; and Warren, David S., 4,510,451, Cl. 328-130.100.
Phillips, John R.; Halbig, James K.; Menlove, Howard O.; and Klosterbuer, Shirley F., 4,510,117, Cl. 376-257.000.
Prosnitz, Donald; and Haas, Roger A., 4,510,455, Cl. 330-4.300.
Reynolds, Carl D., Jr., 4,510,363, Cl. 219-10.710.
Schnacke, Arthur W., 4,510,213, Cl. 429-36.000.
Summers, Mark A.; Eimerl, David; and Boyd, Robert D., 4,510,402, Cl. 307-427.000.
National Aeronautics and Space Administration: *See*—
Clatterbuck, Carroll H.; and Ruitberg, Arthur P., 4,510,476, Cl. 336-84.00C.
Grasso, Albert P., 4,509,548, Cl. 137-99.000.
Hergenrother, Paul M., 4,510,296, Cl. 525-534.000.
St. Clair, Anne K.; Stoakley, Diane M.; St. Clair, Terry L.; and Singh, Jag J., 4,510,277, Cl. 523-454.000.
Navy: *See*—
Andreoli, Charles R., 4,509,427, Cl. 102-261.000.
Cooper, Merton G.; Kerns, William R.; Filley, Daniel E.; and Koschnick, Gary A., 4,509,549, Cl. 137-327.000.
Cowen, Steven J.; and Young, Christopher M., 4,509,827, Cl. 350-320.000.
Garcia, Graham A.; and Cowen, Steven J., 4,510,607, Cl. 372-49.000.
Hellgren, Leroy L., 4,509,808, Cl. 339-17.00R.
Laskowski, Gordon J., 4,509,431, Cl. 104-250.000.
Manuccia, Thomas J.; and Eden, J. Gary, 4,509,522, Cl. 128-634.000.
Morgan, Walter R.; Boniface, Edmund A.; and Huben, Clayton A., 4,509,325, Cl. 60-39.141.

U.S. Philips Corporation: *See*—
Bergen, Franciscus H. M., 4,510,528, Cl. 358-213.000.
Flinn, Ian, deceased; and Murray, Robert, 4,510,471, Cl. 333-195.000.
Janssen, Peter J. M., 4,510,508, Cl. 346-135.100.
Parker, David W.; and van de Polder, Leendert J., 4,510,520, Cl. 358-12.000.
Ruprecht, Jurgen; and Weltersbach, Wolfgang, 4,510,521, Cl. 358-27.000.
Scholten, Carel S.; Slob, Arie; and Jansen, Pierre G., 4,510,612, Cl. 375-106.000.
Van Antwerpen, Hubrecht C., 4,509,342, Cl. 62-514.00R.
van den Brink, Hans G., 4,510,558, Cl. 362-263.000.

United States Steel Corporation: *See*—
Sumansky, L. Walter, 4,509,989, Cl. 134-22.120.

United States Surgical Corporation: *See*—
McGarry, Richard A.; and Noiles, Douglas G., 4,509,518, Cl. 128-325.000.

United Technologies Corporation: *See*—
Blecherman, Sol S., 4,509,616, Cl. 181-214.000.
Guertin, Joseph R., 4,509,299, Cl. 51-237.00R.

Universal Pioneer Corporation: *See—*
Kanamaru, Hitashi; and Kadoo, Fumio, 4,510,592, Cl. 369-270.000.
Universal Spiralweld Enterprises, Inc.: *See—*
Smith, Richard H., Sr., 4,509,447, Cl. 114-65.00R.
Universal Tool Company, Inc.: *See—*
Szczepanek, Thaddeus J., 4,509,346, Cl. 70-16.000.
University of California, Regents of the: *See—*
Hirschfeld, Tomas B., 4,509,370, Cl. 73-705.000.
University of Utah: *See—*
Iskander, Magdy F., 4,510,437, Cl. 324-61.00R.
Uomala, Vilho; Karkkainen, Jouko; and Sandstrom, Kjell, to Oy Wartsila Ab. Valve cover sealing. 4,509,719, Cl. 251-214.000.
UOP Inc.: *See—*
Arens, Blaise J., 4,510,339, Cl. 568-863.000.
Boudreaux, Harry J.; Card, David C.; and Hanson, Bernard M., 4,509,600, Cl. 166-381.000.
Rosen, Bruce I., 4,510,091, Cl. 260-409.000.
Rosen, Bruce I., 4,510,092, Cl. 260-409.000.
Upchurch, James M., to Schlumberger Technology Corporation. Pressure responsive perforating and testing system. 4,509,604, Cl. 175-4.520.
Upjohn Company, The: *See—*
Coleman, James H., 4,510,153, Cl. 514-220.000.
Uranium Pechiney Ugine Kuhlmann: *See—*
Floreancig, Antoine, 4,510,122, Cl. 423-10.000.
Urbach, Herman B.; and Quandt, Earl R. Direct open loop Rankine engine system and method of operating same. 4,509,324, Cl. 60-39.170.
Usiro, Kenzo: *See—*
Bando, Niro; Kurohara, Kazuaki; Fujima, Yasuo; Ikeda, Fumihiro; Usiro, Kenzo; and Ogasawara, Hiroyuki, 4,509,614, Cl. 180-273.000.
USM Corporation: *See—*
Tout, Nigel R.; and Hanson, Raymond, 4,509,271, Cl. 34-12.000.
USV Pharmaceutical Corporation: *See—*
Lee, Thomas D., 4,510,151, Cl. 514-341.000.
Utton, Charles G.; and Stratman, Bill D., to Motorola, Inc. Swinging pod antenna mount. 4,509,709, Cl. 244-118.100.
Uzuhashi, Hideo: *See—*
Suzuki, Akio; Akiyama, Mitsuo; Uzuhashi, Hideo; Ochiai, Izumi; Yamashita, Hitoshi; Sekine, Youji; Matsui, Katsuo; and Tomita, Syuji, 4,509,354, Cl. 72-294.000.
Vaara, Martti. Compounds for use in antibacterial therapy. 4,510,132, Cl. 514-11.000.
Vahratian, Adam; Maynard, Roosevelt, Jr.; Croswhite, Howard L.; and Liang, Po-Lung, to Ford Motor Company. Four speed ratio transaxle with overdrive. 4,509,389, Cl. 74-695.000.
Valdez, Gabriel A.: *See—*
Boggs, William G.; VanDenburgh, David S.; and Valdez, Gabriel A., 4,509,726, Cl. 256-8.000.
Valenzuela, Pablo D. T.: *See—*
Cousens, Lawrence S.; Bell, Graeme I.; and Valenzuela, Pablo D. T., 4,510,245, Cl. 435-172.300.
Valkovich, Phillip B.: *See—*
Chou, Kechia J.; and Valkovich, Phillip B., 4,510,063, Cl. 252-51.50R.
Van Antwerpen, Hubrecht C., to U.S. Philips Corporation. Infrared receiver having a cooled radiation detector. 4,509,342, Cl. 62-514.00R.
VanBerkum, Robert A. Combustion efficiency improving apparatus. 4,509,912, Cl. 431-76.000.
Van Camp, Robert L.: *See—*
Eberline, William C.; Raditke, Norman H.; and Van Camp, Robert L., 4,509,471, Cl. 123-179.00G.
van den Brink, Hans G., to U.S. Philips Corporation. Device for producing and projecting light. 4,510,558, Cl. 362-263.000.
VanDenburgh, David S.: *See—*
Boggs, William G.; VanDenburgh, David S.; and Valdez, Gabriel A., 4,509,726, Cl. 256-8.000.
van de Polder, Leendert J.: *See—*
Parker, David W.; and van de Polder, Leendert J., 4,510,520, Cl. 358-12.000.
Vanderlaan, Robert D.; and Grau, Richard, to Pneumo Corporation. Limited angle torque motor with magnetic centering and stops. 4,510,403, Cl. 310-36.000.
Van Dusen, Paul A.: *See—*
Coutta, John M.; and Van Dusen, Paul A., 4,510,526, Cl. 358-108.000.
Van Raemdonck, Rene ; and Callaert, Andre . Apparatus for moving an individual. 4,509,785, Cl. 294-118.000.
Van Santen, Rutger A.: *See—*
Lewis, Robert M.; Ott, Kevin C.; and Van Santen, Rutger A., 4,510,257, Cl. 502-63.000.
Van Tyne, Richard G.: *See—*
LeBrun, Thomas Q.; Torkelson, John; Dempster, Roy E.; and Van Tyne, Richard G., 4,510,619, Cl. 382-57.000.
VanVonno, N. W., to Harris Corporation. Dielectric isolation fabrication for laser trimming. 4,510,518, Cl. 357-49.000.
Varnum, Gerald F.: *See—*
Gassman, George W.; and Varnum, Gerald F., 4,509,403, Cl. 91-365.000.
Vasudev, Prahalad K., to Hughes Aircraft Company. Solid phase epitaxy and regrowth process with controlled defect density profiling for heteroepitaxial semiconductor on insulator composite substrates. 4,509,990, Cl. 148-1.500.
Vater, Wulf: *See—*
Wehinger, Egbert; Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Towart, Robertson; Stoepel, Kurt; and Kazda, Stanislav, 4,510,310, Cl. 546-321.000.
Vaughan, Philip M., Jr. Hidden passage ball puzzle. 4,509,753, Cl. 273-110.000.
VEB Kombinat Polygraph "Werner Lamberz" Leipzig: *See—*
Hahn, Ulrich; Straube, Peter; and Koch, Michael, 4,509,425, Cl. 101-216.000.
VEB Zentrum fur Forschung und Technologie Mikroelektronik: *See—*
Kleinert, Michael; Moller, Rainer; and Stelzer, Horst, 4,509,456, Cl. 118-715.000.
Vecchi, Alfio: *See—*
Chiolle, Antonio; Vecchi, Alfio; and Credali, Lino, 4,510,185, Cl. 427-222.000.
Veeder Industries Inc.: *See—*
Dolson, Richard G., 4,510,378, Cl. 235-50.00R.
Vega Precision Laboratories, Inc.: *See—*
Chisholm, John P.; and Morgan, Donald G., 4,510,499, Cl. 343-456.000.
Verbos, Stephen P., to Dresser Industries, Inc. Hoist or the like. 4,509,620, Cl. 188-171.000.
Vereczkey, Laszlo: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.
Vereinigte Flugtechnische Werke GmbH: *See—*
Balaskas, Spyros, 4,509,407, Cl. 91-466.000.
Vermaas, Leo F.: *See—*
Schmidt, Werner J.; Dijkshoorn, Willem; Stratmann, Wilhelm; and Vermaas, Leo F., 4,510,167, Cl. 426-607.000.
Vermande, Paul, to Centre National d'Etudes Spatiales. Imaging device, especially for producing images of the earth from a satellite. 4,509,857, Cl. 356-346.000.
Verson Allsteel Press Co.: *See—*
Budrean, John D.; and Kirkpatrick, John A., 4,509,356, Cl. 72-349.000.
Vertegaal, Jacobus G., to Stork Brabant B.V. Printing apparatus, particularly adapted to apply a varnish. 4,509,454, Cl. 118-681.000.
Vertut, Jean: *See—*
Guittet, Jack; Marchal, Paul; Micaelli, Alain; and Vertut, Jean, 4,510,574, Cl. 364-513.000.
Vetco Offshore, Inc.: *See—*
Milberger, Lionel J.; and Bridges, Charles D., 4,509,594, Cl. 166-208.000.
Victor Company of Japan, Ltd.: *See—*
Hirata, Atsumi, 4,510,532, Cl. 358-342.000.
Sugiyama, Hiroyuki, 4,510,531, Cl. 358-342.000.
Tokumitsu, Junsuke, 4,510,535, Cl. 360-14.200.
Tokuyama, Yoshio, 4,510,533, Cl. 360-10.200.
Viechnicki, Dennis J.: *See—*
Caslavsky, Jaroslav L.; Lavoie, Gerald H.; Earle, William H.; and Viechnicki, Dennis J., 4,510,609, Cl. 373-110.000.
Vilain, Michel: *See—*
Esayan, Mariana; and Vilain, Michel, 4,510,118, Cl. 376-282.000.
Villamosipari Kutato Intezel: *See—*
Boday, Otto ; Herpay, Andras; Krajcsovics, Ferenc; Neveri, Istvan; Pete, Sandor; Pocsy, Ferenc; Szikora, Bela; and Szirmai, Endre, 4,509,434, Cl. 110-238.000.
Visek, Tomas, to Steyr-Daimler-Puch Aktiengesellschaft. Reciprocating internal combustion engine. 4,509,475, Cl. 123-195.00A.
Vissani, Carlo: *See—*
Cloutier, Richard; and Vissani, Carlo, 4,509,659, Cl. 222-41.000.
Vittay, Pal: *See—*
Toth, Edit; Torley, Jozsef; Fekete, Gyorgy; Szporny, Laszlo; Vereczkey, Laszlo; Palosi, Eva; Klebovich, Imre; Vittay, Pal; Gorog, Sandor; and Hajdu, Istvan, 4,510,338, Cl. 568-766.000.
Voest-Alpine Aktiengesellschaft: *See—*
Kriegner, Othmar, 4,509,582, Cl. 164-486.000.
Voglaire, Franz. Auto-regenerable capacitor and method of manufacture thereof. 4,509,234, Cl. 29-25.420.
Vogt, Michael: *See—*
Rohlfs, Hans-Adolf; Kling, Alfred; Raab, Guenter; Vogt, Michael; Specht, Viktor; and Schaetzke, Ulrike, 4,510,068, Cl. 252-186.290.
Vollers, Gary L. Screw cap remover. 4,509,784, Cl. 294-99.100.
Vollhardt, Frohmut; and Haacker, Heinz, to M.A.N. Maschinenfabrik Ausburg-Nurnberg Aktiengesellschaft. Upright apparatus for cooling high pressure gases containing a high dust content. 4,509,463, Cl. 122-7.00R.
Volz, Karl; Link, Christoph; Stotz, Wolf-Gunter; and Heitmann, Peter, to Escher Wyss Aktiengesellschaft. Arrangement containing a controlled deflection roll and related regulator. 4,509,237, Cl. 29-116.0AD.
von Blucher, Hasso: *See—*
Blucher, Hubert; von Blucher, Hasso; and de Ruiter, Ernest, 4,510,193, Cl. 428-196.000.
von Kaenel, Fred: *See—*
Plattner, Eric; Staubli, Sebastian; and von Kaenel, Fred, 4,510,100, Cl. 260-508.000.
W & A Bates Limited: *See—*
Goodfellow, Anthony G., 4,510,002, Cl. 156-126.000.
W. R. Grace & Co.: *See—*
Kehr, Clifton L.; Wszolek, Walter R.; and Marans, Nelson S., 4,510,097, Cl. 260-453.00A.

Kim, Gwan; Pereira, Carmo J.; Hegedus, Louis; and Maselli, James M., 4,510,262, Cl. 502-304.000.
Pereira, Carmo J.; Hegedus, Louis; and Maselli, James M., 4,510,261, Cl. 502-304.000.
Pereira, Carmo J.; and Hegedus, Louis, 4,510,263, Cl. 502-314.000.

Wagner, Peter; and Shkawrytko, Victor, to Almicro Electronics Inc. Personal alarm apparatus including wrist supported transmitter and receiver/telephone interface circuit. 4,510,350, Cl. 179-5.00P.

Wagnon, Jean: *See—*
Demarne, Henri; and Wagnon, Jean, 4,510,315, Cl. 548-455.000.

Wahl, Timothy M.: *See—*
Davis, Kevin M.; Wahl, Timothy M.; Beckman, John A.; and Isele, Karl J., Jr., 4,509,727, Cl. 266-44.000.

Walbro Corporation: *See—*
Eberline, William C.; Radtke, Norman H.; and Van Camp, Robert L., 4,509,471, Cl. 123-179.00G.

Walker, James M., to Dril-Quip Inc. Weld-on casing connector. 4,509,777, Cl. 285-286.000.

Walker-Neer Manufacturing Co., Inc.: *See—*
Willis, Clyde A., 4,509,606, Cl. 175-69.000.

Wallqvist, Sven; and Sund, Rune, to Haldex AB. Control device for recording distance measuring instrument attached to a vehicle hub. 4,510,379, Cl. 235-95.00C.

Wallther, Harry, to Stallningsgruppen i Goteborg Aktiebolag. Device for detachably supporting a work stand on a wall surface or the like. 4,509,711, Cl. 248-235.000.

Walsh, Fraser M.: *See—*
Crouse, Dennis N.; Reynolds, James C.; and Walsh, Fraser M., 4,510,214, Cl. 429-43.000.

Walter, Hans-Jurgen, to Mico Datensysteme GmbH. Method of detecting false data recording media and a data recording medium therefor. 4,510,382, Cl. 235-380.000.

Walther, Horst: *See—*
Fischer, Artur; and Walther, Horst, 4,509,246, Cl. 29-526.00R.

Walz, George A.; and Kump, Donald H., to Grumman Aerospace Corporation. Keyboard terminal. 4,510,583, Cl. 364-900.000.

Wamstad, David B., to Honeywell Inc. Very high hermeticity glass to metal seal. 4,509,880, Cl. 403-179.000.

Wang, Cheng-Shi. Signal lead-out apparatus. 4,509,809, Cl. 339-14.00R.

Wang, Lawrence C.: *See—*
Girton, Virgil M.; Marason, Gabriel, Jr.; and Wang, Lawrence C., 4,510,590, Cl. 369-63.000.

Wang, Yen-Hsiung. Ventilated seat. 4,509,792, Cl. 297-180.000.

Ward, John W., to Teledyne Industries, Inc. Personal physiological monitor. 4,509,531, Cl. 128-736.000.

Warnke, Wayne L.: *See—*
Yasui, Toshihiro; and Warnke, Wayne L., 4,509,766, Cl. 280-21.00R.

Warren, Alan: *See—*
Inskip, Michael; and Warren, Alan, 4,510,375, Cl. 219-328.000.

Warren, David S.: *See—*
Longmire, Jerry L.; Thuot, Michael E.; and Warren, David S., 4,510,451, Cl. 328-130.100.

Warrick, James C.: *See—*
Desjardins, Stanley P.; and Warrick, James C., 4,509,621, Cl. 188-372.000.

Warrington Inc.: *See—*
Bourque, Rene, 4,509,276, Cl. 36-115.000.

Wasa, Kiyotaka: *See—*
Inaba, Ritsuo; and Wasa, Kiyotaka, 4,510,443, Cl. 324-120.000.

Watabe, Shin, to Mitsubishi Jukogyo Kabushiki Kaisha. Temperature control device for a refrigerating apparatus having both a heating means and a cooling means. 4,509,586, Cl. 165-29.000.

Watanabe, Jun: *See—*
Mori, Chuzo; Watanabe, Jun; and Kudo, Katsutaka, 4,509,397, Cl. 83-453.000.

Watanabe, Kenkichi; and Furuya, Katusuke, to Laurel Bank Machine Co., Ltd. Coin counting and packaging machine. 4,509,542, Cl. 133-8.00A.

Watanabe, Kuniaki: *See—*
Kagami, Toshiro; and Watanabe, Kuniaki, 4,510,191, Cl. 428-36.000.

Watanabe, Seiichi: *See—*
Tabata, Itsuo; and Watanabe, Seiichi, 4,510,341, Cl. 570-229.000.

Waterman, Raymond C., Jr.: *See—*
Galani, Zvi; and Waterman, Raymond C., Jr., 4,510,463, Cl. 331-15.000.

Watkins, Charles W.: *See—*
Densmore, John C.; and Watkins, Charles W., 4,509,439, Cl. 112-79.00R.

Wayne H. Coloney Company, Inc.: *See—*
Pollock, Stephen F., 4,509,401, Cl. 86-48.000.

Weatherly, Darrel: *See—*
Cockburn, Harrold; Weatherly, Darrel; and Yarbro, Earl, 4,509,468, Cl. 123-90.380.

Weaver, Charles A.; and Stephens, Joseph W., to RCA Corporation. Apparatus and method for automatically controlling an extruder for thermoplastic material. 4,510,104, Cl. 264-40.700.

Webasto-Werk W. Baier GmbH & Co.: *See—*
Bienert, Horst; Kohlpaintner, Georg; and Jardin, Hans, 4,509,791, Cl. 296-216.000.

Weber, Arthur E. Vehicle hitch. 4,509,769, Cl. 280-491.00R.

Weber, Georg: *See—*
Eidenschink, Rudolf; Haas, Gunther; Pohl, Ludwig; Romer, Michael; Scheuble, Bernhard; and Weber, Georg, 4,510,069, Cl. 252-299.610.

Weber, Jurgen: *See—*
Cornils, Boy; Tihanyi, Bela; Weber, Jurgen; DeWin, Werner; Erben, Edwin; and Muhlratzer, August, 4,510,182, Cl. 427-162.000.

Weemes, Doyle A.; and Seymour, Robert W., to Eastman Kodak Company. Copolyesterethers coated with saran. 4,510,205, Cl. 428-483.000.

Weger, Kenneth F., Jr.: *See—*
Knaack, Howard L.; and Weger, Kenneth F., Jr., 4,509,787, Cl. 296-3.000.

Wehinger, Egbert; Meyer, Horst; Bossert, Friedrich; Vater, Wulf; Towart, Robertson; Stoepel, Kurt; and Kazda, Stanislay, to Bayer Aktiengesellschaft. 1,4-Dihydro-2,6-dimethyl-4-(2'-chlorophenyl)-3,5-dicarboxylic acid,methyl or ethyl,trifluoroethyl ester. 4,510,310, Cl. 546-321.000.

Weible, Warren W., to Zeller Corporation, The. Double cardan universal joint with improved centering means. 4,509,932, Cl. 464-109.000.

Weigl, Etta R., executor: *See—*
Weigl, John W., deceased, 4,509,850, Cl. 355-4.000.

Weigl, John W., deceased (by Weigl, Etta R., executor), to Xerox Corporation. Two-color electrophotographic printing machine. 4,509,850, Cl. 355-4.000.

Weir, Donald R.: *See—*
Bolton, Gerald L.; and Weir, Donald R., 4,510,028, Cl. 204-119.000.

Weisert, Edward D., to Rockwell International Corporation. Method of producing diffusion bonded superplastically formed structures. 4,509,671, Cl. 228-157.000.

Weiss, Sherman L. Caulking gun. 4,509,662, Cl. 222-391.000.

Weiss, Wolfgang: *See—*
Tonnius, Dietrich; Weiss, Wolfgang; Orth, Winfried; Miele, Heinrich; and Pastorek, Emmerich, 4,510,090, Cl. 260-396.00R.

Welch, Thomas M., to Duplex Lighting, Inc. Spindle mounting base. 4,509,881, Cl. 403-229.000.

Welch, Willard M., Jr., to Pfizer Inc. Process for preparing carboline derivatives. 4,510,308, Cl. 546-85.000.

Welding, K. C.: *See—*
Conover, Michael S., 4,509,247, Cl. 29-527.400.

Weller, Wolfgang: *See—*
Korsgen, Hans H.; and Weller, Wolfgang, 4,510,305, Cl. 528-494.000.

Wellman, Donald C., to Carrier Corporation. Venturi flow measuring device and method. 4,509,371, Cl. 73-861.000.

Welman, Cornelis M., to Mattel, Inc. Solar tracking system employing inertial coasting. 4,510,385, Cl. 250-203.00R.

Welsch, John H.; Chapko, John J.; and Carver, Robert J., to Metropolitan Wire Corporation. Enclosed shelving. 4,509,805, Cl. 312-210.000.

Weltersbach, Wolfgang: *See—*
Ruprecht, Jurgen; and Weltersbach, Wolfgang, 4,510,521, Cl. 358-27.000.

Wentworth, Robert S., to Borg-Warner Corporation. Pump-mechanical seal construction with axial adjustment means. 4,509,773, Cl. 277-82.000.

Werner, Jurgen: *See—*
Romes, Roman; Schilling, Wolfgang; and Werner, Jurgen, 4,510,474, Cl. 336-30.000.

Wessel, Woif: *See—*
Kull, Hermann; Wessel, Wolf; and Stumpp, Gerhard, 4,509,480, Cl. 123-359.000.

Westfalia Separator AG: *See—*
Gunnewig, Hubert, 4,509,942, Cl. 494-53.000.

Westinghouse Electric Corp.: *See—*
Baker, Donal E., 4,510,399, Cl. 307-57.000.
Bellows, James C., 4,509,332, Cl. 60-660.000.
Brooker, Lenon G., 4,510,199, Cl. 428-248.000.
de Calvino y Teijeiro, Ben J., 4,510,359, Cl. 200-144.0AP.
Golub, Gregory J., 4,510,360, Cl. 200-151.000.
Kobuck, Richard M.; and Jacobs, Arthur F., 4,510,372, Cl. 219-125.110.
Rostron, Joseph R.; and Perulfi, John R., 4,510,477, Cl. 336-92.000.
Sun, Shan C., 4,510,453, Cl. 329-106.000.
Taylor, Lyle H.; and Kasner, William H., 4,510,604, Cl. 372-4.000.

Westlake, Donald: *See—*
Wolfe, Saul; Westlake, Donald; and Jensen, Susan, 4,510,246, Cl. 435-183.000.

Westland plc: *See—*
Gormer, Alan, 4,509,898, Cl. 416-2.000.

Westley, John: *See—*
Liu, Chao-Min; and Westley, John, 4,510,317, Cl. 549-343.000.

Westmoreland, Julius C. Rotary to reciprocating motion converter. 4,509,379, Cl. 74-58.000.

Westwood, Robert; Miller, Peter; Ager, Ian R.; and Kay, David P., to Roussel Uclaf. Antiallergic pyrimido[1,2-a]quinoxalin-2-carboxylic acid derivatives. 4,510,143, Cl. 514-250.000.

Whirlpool Corporation: *See—*
Keane, James W., 4,509,227, Cl. 16-23.000.

White, Harold R., to Alar Engineering Corporation. Filter aid. 4,510,055, Cl. 210-500.100.

White, Harold R., to Alar Engineering Corporation. Method of filtering. 4,510,061, Cl. 210-769.000.

White, James A.: *See—*
Griffin, James R.; and White, James A., 4,509,335, Cl. 62-77.000.

Whiteside, George D.: *See—*
Johnson, Bruce K.; and Whiteside, George D., 4,509,840, Cl. 354-400.000.

Whitford, Rowland E.: *See—*
Smith, Jane E.; and Whitford, Rowland E., 4,509,547, Cl. 137-85.000.

Whiting, James F.; and Koch, Rolf H. L., to Commonwealth of Australia, The. Ultrasound tomography. 4,509,368, Cl. 73-624.000.

Whiting, Laurence V.: *See—*
Szabo, Ervin I.; and Whiting, Laurence V., 4,509,983, Cl. 106-38.200.

Whitted, Beth E.; and Boguslawski, George, to Miles Laboratories, Inc. Use of glucose oxime to increase glucose isomerase activity in bacterial cells. 4,510,247, Cl. 435-207.000.

Whittenburg, Stephen L.; McCormick, David D.; Tweed, William J.; Ozgunay, A. Aykut; and Williams, James T., to Rival Manufacturing Company. Food steaming device. 4,509,412, Cl. 99-331.000.

Whyte, John R., Jr.: *See—*
Morris, Horton H.; Whyte, John R., Jr.; Forbus, Ellen; Dentan, Catherine M.; and Collins, David R., 4,510,254, Cl. 501-146.000.

Wiart, Albert; and Paeye, Gerard, to Jeumont-Schneider Corporation. Solar energy refrigeration device. 4,509,337, Cl. 62-235.100.

Wico Corporation: *See—*
Kim, Syng N., 4,509,631, Cl. 194-1.00A.

Wiech, Raymond E., Jr., to Fine Particles Technology Corporation. Formation of narrow conductive paths on a substrate. 4,510,347, Cl. 174-68.500.

Wiesmann, Herbert L.; and Suhr, Heinz P., to Wilkhahn Wilening + Hahne GmbH + Co. Chair. 4,509,793, Cl. 297-355.000.

Wiewiorowski, Tadeusz; and Mollere, Phillip D., to Freeport Minerals Company. Simultaneous leaching and electrodeposition of precious metals. 4,510,027, Cl. 204-110.000.

Wild, Peter; and Stohr, Frank-Michael, to Bayer Aktiengesellschaft. Cationic mono- and dis-azo dyestuffs, and their preparation and use for dyeing paper and cationic dyeable substrates. 4,509,948, Cl. 8-539.000.

Wilgosz, Robert. Combined firewood rack and fumigator. 4,509,650, Cl. 211-60.100.

Wilhelm, Hans: *See—*
Klaus, Artur; and Wilhelm, Hans, 4,509,668, Cl. 227-8.000.

Wilkhahn Wilening + Hahne GmbH + Co.: *See—*
Wiesmann, Herbert L.; and Suhr, Heinz P., 4,509,793, Cl. 297-355.000.

Wm. W. Meyer & Sons, Inc.: *See—*
Jackson, Carroll V., 4,509,963, Cl. 55-324.000.

Williams, James T.: *See—*
Whittenburg, Stephen L.; McCormick, David D.; Tweed, William J.; Ozgunay, A. Aykut; and Williams, James T., 4,509,412, Cl. 99-331.000.

Williams, Robert J.: *See—*
Gokcen, Cem; and Williams, Robert J., 4,510,115, Cl. 264-515.000.

Willis, Brian J.; Eilerman, Robert G.; Christenson, Philip A.; and Yurecko, John M., Jr., to Fritzsche Dodge & Olcott Inc. Functionalization of terminal trisubstituted alkenes and derivatives thereof. 4,510,319, Cl. 560-231.000.

Willis, Clyde A., to Walker-Neer Manufacturing Co., Inc. Axial return hammer. 4,509,606, Cl. 175-69.000.

Wilson, Harold C. S.: *See—*
King, Paul E.; and Wilson, Harold C. S., 4,509,944, Cl. 604-53.000.

Wilson, Leslie B.: *See—*
Foster, Randy C.; Hackard, Roger G.; and Wilson, Leslie B., 4,509,935, Cl. 474-138.000.

Wilson, Robert C., Jr.: *See—*
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,510,043, Cl. 208-97.000.
Oleck, Stephen M.; and Wilson, Robert C., Jr., 4,510,044, Cl. 208-111.000.

Win, Michael M., to Mobil Oil Corporation. Block and stringer type lift truck pallet. 4,509,432, Cl. 108-51.100.

Windorski, David C.; and Kubiatowicz, David O., to Minnesota Mining & Manufacturing Co. Shielding device for radioactive seed. 4,509,506, Cl. 128-1.200.

Winkler, Harry L. D.C. Stepped-up voltage transformerless battery charger. 4,510,431, Cl. 320-1.000.

Winkler, Hermann; and Sachs, Hanns I., to Bayer Aktiengesellschaft. Process and apparatus for bonding particulate material, in particular chips. 4,510,184, Cl. 427-212.000.

Winterbottom, Bruce. Actuator for transfer circuit breaker switch. 4,510,357, Cl. 200-50.00R.

Wirtz, John W.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,509,581, Cl. 164-479.000.

Wirtz Manufacturing Company, Inc.: *See—*
McLane, Jack E.; Schenk, Raymond L.; Rader, Robert R.; and Wirtz, John W., 4,509,581, Cl. 164-479.000.

Wittekind, Warren D.: *See—*
Boyce, William C.; Wittekind, Warren D.; Howard, Leroy C.; Hall, Thomas E.; and Lechelt, Wayne M., 4,510,573, Cl. 364-498.000.

Wolf, Wolfram: *See—*
Brandt, Eckhard; and Wolf, Wolfram, 4,509,417, Cl. 100-90.000.

Wolfe, Earle C., deceased (by Wolfe, M. Christine, administrator); Jobsky, William G.; and Smith, Thomas P., to Aaron Alarm Systems, Inc. Pool alarm. 4,510,487, Cl. 340-566.000.

Wolfe, M. Christine, administrator: *See—*
Wolfe, Earle C., deceased; Jobsky, William G.; and Smith, Thomas P., 4,510,487, Cl. 340-566.000.

Wolfe, Saul; Westlake, Donald; and Jensen, Susan, to Queen's University at Kingston. Isolation of cyclase, epimerase and a ring expansion enzyme for producing unnatural cephalosporins. 4,510,246, Cl. 435-183.000.

Wolff, Robin K.: *See—*
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,510,340, Cl. 568-884.000.

Wolstenholme, Charles T.: *See—*
Sipple, Douglas E.; and Wolstenholme, Charles T., 4,509,223, Cl. 15-160.000.

Womersley, Peter: *See—*
Holland, Frank S.; Womersley, Peter; and Curran, John, 4,510,095, Cl. 260-429.700.

Wood, Irwin B., to American Cyanamid Co. Controlling nematodes in animals and soil with nematocidal antibiotics. 4,510,134, Cl. 514-27.000.

Woodhull, Ivan D., Jr.; and Liedel, Thomas H., to Karmazin Products Corporation. Method of constructing headers of heat exchangers. 4,509,672, Cl. 228-175.000.

Woodland, Carl R., to Dayco Corporation. Endless power transmission belt having a toothed compression section and method of making the same. 4,509,938, Cl. 474-264.000.

Woods, Dewey W.: *See—*
Tullos, Homan C.; and Woods, Dewey W., 4,509,605, Cl. 175-57.000.

Woodward, Oakley M., Jr.; and Greaves, Milton P., Jr., to RCA Corporation. Broadband loop antenna with low wind resistance. 4,510,501, Cl. 343-742.000.

Wotton, David R.: *See—*
Drotar, Frederick L.; Wotton, David R.; Dickerson, Carroll D.; and Makowski, Lawrence A., 4,509,772, Cl. 280-661.000.

Wright, Cecil W.: *See—*
Muhle, Mike E.; Stolz, Richard J.; and Wright, Cecil W., 4,510,271, Cl. 523-346.000.

Wright, Dennis C.; and Camodeca, Ernest J., to Elkem Metals Company. Slide gate valve for dry bulk discharging containers. 4,509,717, Cl. 251-144.000.

Wright, Eric: *See—*
Newton, Ronald O.; and Wright, Eric, 4,509,801, Cl. 303-8.000.

Wright, Peter J.: *See—*
Cockayne, Brian; Griffiths, Richard J. M.; and Wright, Peter J., 4,509,997, Cl. 148-175.000.

Wrobel, James: *See—*
McClanahan, John B.; LaVoie, Marvin E.; Kelsoe, Wayne E.; and Wrobel, James, 4,510,482, Cl. 338-24.000.

Wszolek, Walter R.: *See—*
Kehr, Clifton L.; Wszolek, Walter R.; and Marans, Nelson S., 4,510,097, Cl. 260-453.00A.

Wu, Wan C., to Monsanto Company. ABS Compositions and process for preparing same. 4,510,287, Cl. 525-84.000.

Wuermli, Arthur, to Rieter Machine Works Ltd. Drafting mechanism for a spinning machine. 4,509,230, Cl. 19-245.000.

Wuhrer, Wolfgang, to Sulzer-Escher Wyss GmbH. Marine vessel propeller with nozzle. 4,509,925, Cl. 440-67.000.

Wurfel, Gernot: *See—*
Breuser, Erich; Grozinger, Wilhelm; Latsch, Reinhard; and Wurfel, Gernot, 4,509,476, Cl. 123-266.000.

Wuthrich, Kurt: *See—*
Ernst, Richard R.; Wuthrich, Kurt; and Macura, Slobodan, 4,510,449, Cl. 324-309.000.

Wylie, M. Martin. Oil recovery apparatus. 4,510,054, Cl. 210-242.300.

Xerox Corporation: *See—*
Araghi, Mehdi N., 4,509,826, Cl. 350-286.000.
Ippolito, Ronald A.; and Dugan, Michael T., 4,509,851, Cl. 355-14.00C.
Weigl, John W., deceased, 4,509,850, Cl. 355-4.000.

Yabe, Hisao, to Olympus Optical Co., Ltd. Endoscope apparatus. 4,509,507, Cl. 128-4.000.

Yabe, Minoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, to Hitachi, Ltd. Electrode structure for electron gun. 4,510,413, Cl. 313-460.000.

Yagi, Shigenori; Kuzumoto, Masaki; Tanaka, Masaaki; and Ogawa, Shuji, to Mitsubishi Denki Kabushiki Kaisha. Silent discharge type pulse laser device. 4,510,606, Cl. 372-25.000.

Yagi, Toshizo, to Japan Life Company Limited. Sleeping mattress. 4,509,219, Cl. 5-481.000.

Yamabe, Tsunekichi: *See—*
Matsuoka, Hiroo; Matsuoka, Seiichi; Yamabe, Tsunekichi; Fujie, Hirokazu; Mori, Kenji; Tamura, Kouji; Yamada, Masatoshi; and Furuta, Akio, 4,510,264, Cl. 502-328.000.

Yamachika, Hiroshi: *See—*
Saito, Kenji; and Yamachika, Hiroshi, 4,510,329, Cl. 568-310.000.

Yamada, Jun: *See—*
Miura, Kuniaki; Shibata, Akira; Yamada, Jun; and Hazama, Katashi, 4,510,530, Cl. 358-314.000.
Yuhara, Akitsuna; Nate, Kazuo; Toyama, Tatsuro; and Yamada, Jun, 4,510,410, Cl. 310-313.00D.

Yamada, Ken'ichi; Sumitomo, Hiroyuki; Horiguchi, Akira; and Masutani, Kenzo, to Hisaka Works, Ltd. Plate type evaporator. 4,509,592, Cl. 165-166.000.

Yamada, Masatoshi: *See—*
Matsuoka, Hiroo; Matsuoka, Seiichi; Yamabe, Tsunekichi; Fujie, Hirokazu; Mori, Kenji; Tamura, Kouji; Yamada, Masatoshi; and Furuta, Akio, 4,510,264, Cl. 502-328.000.

Yamada, Sadayoshi: *See—*
Nakamura, Hiromi; Mochizuki, Zenichi; Motomura, Noriyuki; and Yamada, Sadayoshi, 4,510,371, Cl. 219-121.0LM.

Yamagata, Seiichi: *See*—
Kajita, Koji; Nakayama, Takashi; and Yamagata, Seiichi, 4,509,321, Cl. 57-328.000.

Yamaguchi, Ken, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle air cleaner arrangement. 4,509,613, Cl. 180-219.000.

Yamaguchi, Kenshiro: *See*—
Mehada, Masashi; Yoshiwara, Shozo; Yamaguchi, Kenshiro; and Iwao, Osamu, 4,510,207, Cl. 428-607.000.

Yamaguchi, Masahiko; Gonda, Michihiro; Satoh, Yutaka; and Kanasugi, Mikiko, to Hodogaya Chemical Co., Ltd. Heat sensitive record sheet. 4,510,513, Cl. 346-214.000.

Yamaguchi, Yasuhiro; and Sakatani, Yoshiaki, to Agency of Industrial Science and Technology. Method of molding a composite body involving a thermosetting resin. 4,510,103, Cl. 264-40.200.

Yamaha Hatsudoki Kabushiki Kaisha: *See*—
Yasui, Toshihiro; and Warnke, Wayne L., 4,509,766, Cl. 280-21.00R.

Yamakawa, Shinzo: *See*—
Murata, Norio; Hoshino, Mitsutoshi; and Yamakawa, Shinzo, 4,509,820, Cl. 350-96.210.

Yamamoto, Noboru: *See*—
Yamasaki, Tetsuya; Okuda, Eiji; and Yamamoto, Noboru, 4,509,824, Cl. 350-167.000.

Yamamoto, Takashi: *See*—
Ikemoto, Kazuhito; Terakura, Yukio; Miyake, Takashi; and Yamamoto, Takashi, 4,509,381, Cl. 74-413.000.

Yamamoto, Yohzoh: *See*—
Oda, Hidekuni; Minami, Syuji; Inoue, Hiroshi; Matsuda, Akira; and Yamamoto, Yohzoh, 4,510,303, Cl. 526-282.000.

Yamane, Akira: *See*—
Sawanishi, Shigeru; Shiomi, Yozo; and Yamane, Akira, 4,510,111, Cl. 264-177.00F.

Yamasaki, Tetsuya; Okuda, Eiji; and Yamamoto, Noboru, to Nippon Sheet Glass Co., Ltd. Plate lens and a method for manufacturing the same. 4,509,824, Cl. 350-167.000.

Yamashita, Hitoshi: *See*—
Suzuki, Akio; Akiyama, Mitsuo; Uzuhashi, Hideo; Ochiai, Izumi; Yamashita, Hitoshi; Sekine, Youji; Matsui, Katsuo; and Tomita, Syuji, 4,509,354, Cl. 72-294.000.

Yamashita, Kiyoshi: *See*—
Matsuzaka, Syoji; Kajiwara, Makoto; Miyoshi, Masanobu; and Yamashita, Kiyoshi, 4,510,234, Cl. 430-557.000.

Yamato Chemical Industry Co. Ltd.: *See*—
Inoue, Setsuro; Nikaido, Koichi; and Nakagome, Makoto, 4,510,192, Cl. 428-151.000.

Yamato Scale Company, Limited: *See*—
Hayashi, Junichi, 4,509,610, Cl. 177-211.000.

Yamauchi, Masaaki: *See*—
Yabe, Minoru; Noda, Kenichi; Endo, Satoru; and Yamauchi, Masaaki, 4,510,413, Cl. 313-460.000.

Yamauchi, Shinya: *See*—
Maruyama, Teruo; and Yamauchi, Shinya, 4,509,905, Cl. 418-75.000.

Yamazaki, Haruo: *See*—
Ogata, Yoshiro; Yamazaki, Haruo; and Akutsu, Hidezoh, 4,510,415, Cl. 313-493.000.

Yamazaki, Hisashi; and Ochiai, Takeji, to Fuji Photo Film Co., Ltd. Radiation image storage panel. 4,510,388, Cl. 250-327.200.

Yamazaki, Makoto: *See*—
Uchida, Isamu, deceased; Fujii, Chigusa, heiress; Kokubo, Eiichi; Osako, Kyoichi; Yamazaki, Makoto; Imura, Shinichi; Arikawa, Junichi; Goi, Kowichi; Hongou, Hiroshi; Shinozaki, Takashi; and Emori, Hiroshi, 4,510,380, Cl. 235-379.000.

Yamazaki, Shingo: *See*—
Ishizaki, Takaharu; Kimura, Tsuneo; and Yamazaki, Shingo, 4,509,954, Cl. 44-62.000.

Yamazaki, Toshinori; Nomori, Hiroyuki; Matsuzaki, Masatoshi; Shima, Tetsuo; and Myokan, Isao, to Konishiroku Photo Industry Co., Ltd. Electrophotographic photoreceptors having amorphous silicon photoconductors. 4,510,224, Cl. 430-57.000.

Yarbro, Earl: *See*—
Cockburn, Harrold; Weatherly, Darrel; and Yarbro, Earl, 4,509,468, Cl. 123-90.380.

Yardy, Raymond: *See*—
Tabata, George K.; and Yardy, Raymond, 4,510,536, Cl. 360-65.000.

Yasuda, Hyo: *See*—
Mori, Kenzo; Yasuda, Hyo; and Suzuki, Minoru, 4,510,498, Cl. 343-435.000.

Yasuda, Satoshi: *See*—
Nakagome, Hideki; and Yasuda, Satoshi, 4,509,334, Cl. 62-6.000.

Yasuda, Tomio; and Ichiyama, Toshiyuki, to Kabushiki Kaishi Meidensha. Electric field detector. 4,510,441, Cl. 324-96.000.

Yasui Sangyo Co., Ltd.: *See*—
Shimura, Tatsuo, 4,509,723, Cl. 254-93.00H.

Yasui, Toshihiro; and Warnke, Wayne L., to Yamaha Hatsudoki Kabushiki Kaisha. Anti-rolling system for snowmobile of small size. 4,509,766, Cl. 280-21.00R.

Yasui, Yasuyoshi: *See*—
Inui, Masaki; and Yasui, Yasuyoshi, 4,509,385, Cl. 74-477.000.

Yasunaga, Makoto: *See*—
Kurihara, Toshio; Kunita, Masao; Yasunaga, Makoto; Masuda, Katuya; Moriya, Takashi; and Oosawa, Seiichi, 4,509,421, Cl. 101-93.040.

Yee, David M.: *See*—
Bickley, Robert H.; Bucher, Charles A.; and Yee, David M., 4,510,472, Cl. 333-262.000.

Yeh, An-I: *See*—
Berg, Lloyd; and Yeh, An-I, 4,510,022, Cl. 203-51.000.

Yeh, Gregory Y. S., to Championship Electronics (USA) Inc. Joystick controller. 4,509,383, Cl. 74-471.0XY.

Yeomans, Michael A.: *See*—
Ross, Barry C.; Johnson, Graham; and Yeomans, Michael A., 4,510,086, Cl. 260-239.00A.

Yokochi, Kiyoshi: *See*—
Hoshi, Ikuo; Arai, Masami; Yokochi, Kiyoshi; Miyadera, Yasuo; Fujioka, Atsushi; and Nakagawa, Takehisa, 4,510,008, Cl. 156-245.000.

Yokohama Rubber Co., Ltd., The: *See*—
Kawakami, Kinya, 4,510,291, Cl. 525-237.000.

Yokota, Mitsuyoshi; and Matsumoto, Akio, to Mitsubishi Denki Kabushiki Kaisha. Control device for pump apparatus for vehicular use. 4,510,425, Cl. 318-484.000.

Yokote, Sachio: *See*—
Kawai, Yoichi; Gotoh, Yoshihisa; and Yokote, Sachio, 4,510,079, Cl. 252-511.000.

Yokoyama, Hiroshi: *See*—
Takano, Hiroshi; Yokoyama, Hiroshi; and Mizuno, Takahide, 4,510,113, Cl. 264-257.000.

Yokoyama, Katsunori: *See*—
Suda, Yoshiyuki; Yokoyama, Katsunori; and Tanuma, Chiaki, 4,510,412, Cl. 310-328.000.

Yokoyama, Shigeki; Hibino, Akira; Maekawa, Yukio; and Kawasaki, Hiroshi, to Fuji Photo Film Co., Ltd. Antistatic agent containing silver halide photographic light-sensitive materials. 4,510,233, Cl. 430-527.000.

Yomogida, Toshihiko; Suzuki, Yasuo; and Ito, Kyoji, to Toyoda Koki Kabushiki Kaisha. Programmable sequence controller. 4,510,580, Cl. 364-900.000.

Yoneda, Osamu, to Tokusen Kogyo Kabushiki Kaisha. Steel cord. 4,509,318, Cl. 57-212.000.

Yonekura, Mikio, to Amada Company Limited. Control system for presses. 4,510,570, Cl. 364-476.000.

Yonushonis, Celeste B.: *See*—
Felice, Frank T.; and Yonushonis, Celeste B., 4,510,253, Cl. 501-95.000.

Yorke, Monica A.: *See*—
Amjad, Zahid; and Yorke, Monica A., 4,510,059, Cl. 210-701.000.

Yoshida, Kenji; Nakazawa, Makoto; Shike, Toyohiko; Tomida, Masayuki; Tsuda, Masataka; and Teraoka, Toru, to Mitsubishi Chemical Industries Ltd. Thiazolidine compound and fungicidal composition containing it. 4,510,154, Cl. 514-365.000.

Yoshida, Koichi: *See*—
Miyashita, Teruo; and Yoshida, Koichi, 4,510,030, Cl. 204-147.000.

Yoshida, Shigemasa; and Araki, Ichiro, to Computer Basic Technology Research Assoc. Magnetic head moving velocity detector. 4,510,537, Cl. 360-78.000.

Yoshida, Takao: *See*—
Mookherjee, Braja D.; Trenkle, Robert W.; Wolff, Robin K.; Boden, Richard M.; and Yoshida, Takao, 4,510,340, Cl. 568-884.000.

Yoshida, Tatsuo; Fukuda, Kikuo; and Tomiguchi, Akihiko, to Shinko Kosen Kogyo Kabushiki Kaisha. Wire rope. 4,509,319, Cl. 57-218.000.

Yoshida, Toshio; Itoga, Kouyu; Matsui, Shigetomo; and Atsuta, Toshio, to Kawasaki Jukogyo Kabushiki Kaisha. Corrosion-resistant pipe coupling structures. 4,509,776, Cl. 285-55.000.

Yoshikawa, Kazuhisa: *See*—
Tanaka, Tsuyoshi; and Yoshikawa, Kazuhisa, 4,509,699, Cl. 241-268.000.

Yoshimura, Noriaki; and Tamura, Masuhiko, to Kuraray Company, Ltd. Processes for producing 7-octen-1-al and derivatives thereof. 4,510,331, Cl. 568-450.000.

Yoshimura, Noriaki: *See*—
Matsumoto, Mitsuo; Yoshimura, Noriaki; and Tamura, Masuhiko, 4,510,332, Cl. 568-454.000.

Yoshimura, Shozo: *See*—
Mehada, Masashi; Yoshimura, Shozo; Yamaguchi, Kenshiro; and Iwao, Osamu, 4,510,207, Cl. 428-607.000.

Youcha, Jack. Multiple lens cover for solar heating panel. 4,509,502, Cl. 126-440.000.

Young, Christopher M.: *See*—
Cowen, Steven J.; and Young, Christopher M., 4,509,827, Cl. 350-320.000.

Young, David A.; and Hummel, William H., to Draw-Tite, Inc. Drawbar cover. 4,509,770, Cl. 280-507.000.

Young, James E. Solar heating system. 4,509,503, Cl. 126-452.000.

Young, Jeffrey E., to Lanier Business Products, Inc. Continuous loop cassette changer apparatus for a dictation/transcription system. 4,510,539, Cl. 360-92.000.

Young, Quentin H., to Southern Steel Company. Door locking system. 4,509,347, Cl. 70-129.000.

Young, Randall S.; and Fredericks, Ronald D., Jr., to Dairy & Food Labs, Inc. Composition having neutralized differential infrared absorbency. 4,510,072, Cl. 252-380.000.

Young, Tommy L.: *See*—
Parlman, Robert M.; Bresson, Clarence R.; and Young, Tommy L., 4,510,050, Cl. 209-167.000.

Yuasa, Akihiko: *See*—
Morita, Seiichiro; Yuasa, Akihiko; and Arai, Takao, 4,509,236, Cl. 29-26.00A.
Yuasa Battery Co. Ltd.: *See*—
Kagawa, Hiroshi; and Matsui, Kazumasa, 4,510,217, Cl. 429-104.000.
Yuhara, Akitsuna; Nate, Kazuo; Toyama, Tatsuro; and Yamada, Jun, to Hitachi, Ltd. Elastic surface wave absorbers comprising ultraviolet light curable resin. 4,510,410, Cl. 310-313.00D.
Yuhara, Mitsuho. Golf swing diagnosing device. 4,509,757, Cl. 273-186.00A.
Yurecko, John M., *Jr.*: *See*—
Willis, Brian J.; Eilerman, Robert G.; Christenson, Philip A.; and Yurecko, John M., *Jr.*, 4,510,319, Cl. 560-231.000.
Zaccheroni, Giulio. Apparatus for continuously dip-zincing of metallic wire or strip material. 4,509,453, Cl. 118-420.000.
Zaidan Hojin Minsei Kagaku Kyokai: *See*—
Fujimaki, Akira, 4,510,161, Cl. 514-54.000.
Zambrano, Adolfo R., to Owens-Corning Fiberglas Corporation. Production of ferroboron. 4,509,976, Cl. 75-21.000.
Zawitz, Richard E. Annular support device with pivotal segments. 4,509,929, Cl. 446-102.000.
Zbornik, Vaclav, to Hammerle AG Maschinenfabrik. Tool arrangement for a bending press. 4,509,357, Cl. 72-384.000.
Zeller Corporation, The: *See*—
Weible, Warren W., 4,509,932, Cl. 464-109.000.
Zenith Electronics Corporation: *See*—
Kiteley, Kenneth J., 4,510,400, Cl. 307-66.000.
Zibelin, Henry S. Kidney stone instrument. 4,509,517, Cl. 128-319.000.
Zimber, Bela; and Molnar, Imre, to Kozponti Valto. Pneumatically controlled pressure transducer for operating hydraulic work tools. 4,509,330, Cl. 60-537.000.
Zimmern, Bernard. Economizer device for a refrigerating machine, a heat-pump or the like. 4,509,341, Cl. 62-512.000.
Znaimer, Samuel: *See*—
Skinner, Ronald W.; Tao, John C.; and Znaimer, Samuel, 4,510,040, Cl. 208-10.000.
Zoecon Corporation: *See*—
Lee, Shy-Puh, 4,509,970, Cl. 71-86.000.
Zones, Stacey I., to Chevron Research Company. Zeolite SSZ-19. 4,510,256, Cl. 502-62.000.
ZVS Vyzkumnevyvojovy Ustav, koncernova ucelova organizace: *See*—
Pajgrt, Jan; Bezdicek, Jan; and Novak, Jiri, 4,509,629, Cl. 192-0.098.
Zyma SA: *See*—
Albert, Alban I.; Ballenegger, Marc E.; Overeem, Jan C.; and Tyson, Robert G., 4,510,159, Cl. 514-456.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 9TH DAY OF APRIL, 1985

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

IDR, Inc.: *See*—
Saylor, Richard; and Nagel, Robert H., Re. 31,863, Cl. 358-141.000.

Logan, Kenneth C.; and Ludhe, Friedrich O. B., to Sunds Defibrator, Inc. Apparatus for the treatment of lignocellulosic material. Re. 31,862, Cl. 241-41.000.

Ludhe, Friedrich O. B.: *See*—
Logan, Kenneth C.; and Ludhe, Friedrich O. B., Re. 31,862, Cl. 241-41.000.

Nagel, Robert H.: *See*—
Saylor, Richard; and Nagel, Robert H., Re. 31,863, Cl. 358-141.000.

Outboard Marine Corporation: *See*—
Prince, Anthony P., Re. 31,861, Cl. 192-0.096.

Prince, Anthony P., to Outboard Marine Corporation. Single lever remote control for engine throttle and clutch. Re. 31,861, Cl. 192-0.096.

Saylor, Richard; and Nagel, Robert H., to IDR, Inc. Row grabbing system. Re. 31,863, Cl. 358-141.000.

Shannon, Alan J.: *See*—
van Bavel, Michael G.; and Shannon, Alan J., Re. 31,864, Cl. 371-20.000.

Sunds Defibrator, Inc.: *See*—
Logan, Kenneth C.; and Ludhe, Friedrich O. B., Re. 31,862, Cl. 241-41.000.

Texas Instruments Incorporated: *See*—
van Bavel, Michael G.; and Shannon, Alan J., Re. 31,864, Cl. 371-20.000.

van Bavel, Michael G.; and Shannon, Alan J., to Texas Instruments Incorporated. Self-test feature for appliance or electronic systems operated by microprocessor. Re. 31,864, Cl. 371-20.000.

LIST OF DESIGN PATENTEES

A. B. Chance Company: *See*—
McNaghten, Delmar E.; Kent, Dennis C.; and Brown, Robert A., 278,331, Cl. D13-35.000.

A/S Vestfrost: *See*—
Damkjaer, Erling, 278,342, Cl. D15-88.000.

Adam, Robert A.: *See*—
Cleevely, Bruce T.; and Adam, Robert A., 278,312, Cl. D9-449.000.

Allen, Dennis M. Stud bolt wrench. 278,310, 4-9-85, Cl. D8-21.000.

Altena Salotti, s.r.l.: *See*—
Giudici, Gianbattista, 278,287, Cl. D6-381.000.

ALZA Corporation: *See*—
Schenkel, Lotte; and Fankhauser, Peter, 278,363, Cl. D24-49.000.

American Commercial, Incorporated: *See*—
Laslo, Larry R., 278,299, Cl. D7-151.000.
Laslo, Larry R., 278,300, Cl. D7-151.000.
Laslo, Larry R., 278,301, Cl. D7-151.000.
Laslo, Larry R., 278,302, Cl. D7-151.000.
Laslo, Larry R., 278,303, Cl. D7-151.000.
Laslo, Larry R., 278,304, Cl. D7-151.000.
Seibel, Ben, 278,296, Cl. D7-13.000.

Anderson, James E.: *See*—
Baker, Dennis O.; and Anderson, James E., 278,329, Cl. D12-203.000.

Arai, Noriyuki: *See*—
Kurokawa, Koya; and Arai, Noriyuki, 278,338, Cl. D14-78.000.

AT&T Bell Laboratories: *See*—
Girardi, Joseph; and Sylvester, Gordon E., 278,336, Cl. D14-52.000.

Baker, Dennis O.; and Anderson, James E., to Owens-Classic, Inc. Motor vehicle running board. 278,329, 4-9-85, Cl. D12-203.000.

Banko, Ronald C., to Comdial Telephone Systems, Inc. Telephone. 278,337, 4-9-85, Cl. D14-58.000.

Bellini, Mario, to Ing. C. Olivetti & C., S.p.A. Electronic typewriter. 278,350, 4-9-85, Cl. D18-1.000.

Bengtson, Darroll D., to Rosemount Inc. Flowmeter flow tube. 278,316, 4-9-85, Cl. D10-96.000.

Birchenall, Richard W. Combined can opener and shot measurer. 278,307, 4-9-85, Cl. D8-34.000.

Blackmore, Fred N., Jr. Segmented plant container. 278,323, 4-9-85, Cl. D11-155.000.

Bowen, Michael W. Spool and spindle rocking chair. 278,284, 4-9-85, Cl. D6-348.000.

Breen, John D., to Murray Ohio Manufacturing Co., The. Bicycle frame. 278,324, 4-9-85, Cl. D12-111.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,351, Cl. D18-1.000.

Brown, John M.; Herritz, Donald; Ottinger, Barbara L.; and Westmas, Leland D., to Gerber Products Company. Combined hood and collar. 278,311, 4-9-85, Cl. D9-436.000.

Brown, Robert A.: *See*—
McNaghten, Delmar E.; Kent, Dennis C.; and Brown, Robert A., 278,331, Cl. D13-35.000.

Cagney, Stanton M., to First National Precision Products, Inc. Vehicle warning light. 278,365, 4-9-85, Cl. D26-28.000.

CAPS Industries: *See*—
Gordon, F. Scott; Fender, Derek H.; and Dolan, Michael J., 278,345, Cl. D15-199.000.

Cascarano, Anthony J.: *See*—
Matsuda, Hari; Cascarano, Anthony J.; and Schwimmer, Charles M., 278,335, Cl. D14-39.000.

Caven, Terence T., to Plessey Overseas Limited. Keyboard for a data terminal. 278,339, 4-9-85, Cl. D14-100.000.

Cerberus A.G.: *See*—
Meier, Otto; and Huber, Felix, 278,332, Cl. D13-35.000.

Chen, Ming-Ter. Plate or the like. 278,297, 4-9-85, Cl. D7-24.000.

Cleevely, Bruce T.; and Adam, Robert A., to General Foods Corporation. Dispensing closure. 278,312, 4-9-85, Cl. D9-449.000.

Comdial Telephone Systems, Inc.: *See*—
Banko, Ronald C., 278,337, Cl. D14-58.000.

Con-Serv Incorporated: *See*—
Rattray, Thomas, 278,362, Cl. D23-155.000.

Crane, Douglas A.: *See*—
Crane, Stephen; and Crane, Douglas A., 278,319, Cl. D10-114.000.

Crane Manufacturing and Plastics Corp.: *See*—
Crane, Stephen; and Crane, Douglas A., 278,319, Cl. D10-114.000.

Crane, Stephen; and Crane, Douglas A., to Crane Manufacturing and Plastics Corp. Reflector for dash mounted vehicle emergency flashing light or the like. 278,319, 4-9-85, Cl. D10-114.000.

Daiwa Seiko, Inc.: *See*—
Sugimoto, Tatsuo, 278,359, Cl. D22-25.000.

Damkjaer, Erling, to A/S Vestfrost. Refrigerator cabinet. 278,342, 4-9-85, Cl. D15-88.000.

Dau, John J. Table. 278,294, 4-9-85, Cl. D6-477.000.

De Lucchi, Michele: *See*—
Sottsass, Ettore; and De Lucchi, Michele, 278,289, Cl. D6-487.000.

Dolan, Michael J.: *See*—
Gordon, F. Scott; Fender, Derek H.; and Dolan, Michael J., 278,345, Cl. D15-199.000.

Doman, Donald W.: *See*—
Kohler, Herbert V., Jr.; and Doman, Donald W., 278,360, Cl. D23-55.000.

Dondero, John D.: *See*—
Gregory, John R.; Parks, Gerald R.; and Dondero, John D., 278,280, Cl. D2-27.000.

Drag Specialties, Inc.: *See*—
Rudd, Thomas H., 278,282, Cl. D2-394.000.

Dreir, Jeffrey: *See*—
Dreir, Stanley A.; and Dreir, Jeffrey, 278,281, Cl. D2-314.000.

Dreir, Stanley A.; and Dreir, Jeffrey. Stripes portion of an athletic shoe. 278,281, 4-9-85, Cl. D2-314.000.

Enomoto, Haruyuki, to Sony Corporation. Computer. 278,340, 4-9-85, Cl. D14-100.000.

Equi, John E. Expansion chamber. 278,326, 4-9-85, Cl. D12-194.000.

Everitt, Delmar K.: *See*—
Goldfarb, Adolph E.; and Everitt, Delmar K., 278,356, Cl. D21-141.000.

F. LLI Guzzini S.p.A.: *See*—
Talocci, Giovanna; and Lenci, Fabio, 278,288, Cl. D6-525.000.

Fankhauser, Peter: *See*—
Schenkel, Lotte; and Fankhauser, Peter, 278,363, Cl. D24-49.000.

Fender, Derek H.: *See*—
Gordon, F. Scott; Fender, Derek H.; and Dolan, Michael J., 278,345, Cl. D15-199.000.

First National Precision Products, Inc.: *See*—
Cagney, Stanton M., 278,365, Cl. D26-28.000.

Franklin, Marsha S.: *See*—
Pringle, Larry E.; and Franklin, Marsha S., 278,369, Cl. D28-60.000.

Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, to Brother Kogyo Kabushiki Kaisha. Typewriter. 278,351, 4-9-85, Cl. D18-1.000.

Garvis, Victor P. Multiple hold-down clamp. 278,308, 4-9-85, Cl. D8-73.000.

General Foods Corporation: *See*—
Cleevely, Bruce T.; and Adam, Robert A., 278,312, Cl. D9-449.000.

Gerber Products Company: *See*—
Brown, John M.; Herritz, Donald; Ottinger, Barbara L.; and Westmas, Leland D., 278,311, Cl. D9-436.000.

Girardi, Joseph; and Sylvester, Gordon E., to AT&T Bell Laboratories. Communication apparatus enclosure. 278,336, 4-9-85, Cl. D14-52.000.

Giudici, Gianbattista, to Altena Salotti, s.r.l. Seat. 278,287, 4-9-85, Cl. D6-381.000.

Goldfarb, Adolph E.; and Everitt, Delmar K., to Goldfarb, Adolph E. Tire for toy vehicle. 278,356, 4-9-85, Cl. D21-141.000.

Gordon, F. Scott; Fender, Derek H.; and Dolan, Michael J., to CAPS Industries. Printed circuit board component mounting machine. 278,345, 4-9-85, Cl. D15-199.000.

Goto, Tetsuya: *See*—
Saito, Yasuhiro; Goto, Tetsuya; and Umino, Toshio, 278,346, Cl. D16-31.000.

Gregory, John R.; Parks, Gerald R.; and Dondero, John D., to Gregory, John R. Chest and shoulder protector. 278,280, 4-9-85, Cl. D2-27.000.

Gurule, Jack L. Clothing hanger support. 278,291, 4-9-85, Cl. D6-328.000.

Haker, Floyd H. Coupon distribution machine. 278,374, 4-9-85, Cl. D99-99.000.

Hardinge Brothers, Inc.: *See*—
Smith, Roger R., 278,344, Cl. D15-140.000.

Harper Truck, Inc.: *See*—
Rousseau, Kenneth E., 278,373, Cl. D34-26.000.

Hartwick, Don. Feeder accessory for a bird cage. 278,372, 4-9-85, Cl. D30-14.000.

Herritz, Donald: *See*—
Brown, John M.; Herritz, Donald; Ottinger, Barbara L.; and Westmas, Leland D., 278,311, Cl. D9-436.000.

Hill, Royce W., to Micro Plastics Inc. Printed circuit board standoff. 278,330, 4-9-85, Cl. D13-24.000.

Hoese, Fred O. Motorcycle radio housing. 278,328, 4-9-85, Cl. D12-114.000.

Holes-Webway Company, The: *See*—
Wenstrom, Roger A.; Holes, William W.; and Raiter, Leon C., 278,352, Cl. D19-26.000.

Holes, William W.: *See*—
Wenstrom, Roger A.; Holes, William W.; and Raiter, Leon C., 278,352, Cl. D19-26.000.

Horgan Investments Pty. Ltd.: *See*—
Horgan, Robert H. R., 278,348, Cl. D16-135.000.

Horgan, Robert H. R., to Horgan Investments Pty. Ltd. Magnifier viewing unit. 278,348, 4-9-85, Cl. D16-135.000.

Houlihan, John T., to Timex Corporation. Watch case. 278,315, 4-9-85, Cl. D10-30.000.

Huber, Felix: *See*—
Meier, Otto; and Huber, Felix, 278,332, Cl. D13-35.000.

Hurco Manufacturing Co., Inc.: *See*—
Roch, Gerald V., 278,343, Cl. D15-123.000.

Ing. C. Olivetti & C., S.p.A.: *See*—
Bellini, Mario, 278,350, Cl. D18-1.000.

International Jensen Incorporated: *See*—
Matsuda, Hari; Cascarano, Anthony J.; and Schwimmer, Charles M., 278,335, Cl. D14-39.000.

Itoh, Masafumi: *See*—
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,351, Cl. D18-1.000.

Iversen, Alfred L.: *See*—
Van Beek, Allen L.; and Iversen, Alfred L., 278,314, Cl. D10-53.000.

Jelvestam, Roland E. Supersonic transceiver level measure device. 278,317, 4-9-85, Cl. D10-101.000.

Karlsson, Sigvard G. Greenhouse. 278,364, 4-9-85, Cl. D25-15.000.

Kawazu, Hideyuki, to Olympus Optical Company, Ltd. Automatic original feed for copying apparatus. 278,347, 4-9-85, Cl. D16-32.000.

Kent, Dennis C.: *See*—
McNaghten, Delmar E.; Kent, Dennis C.; and Brown, Robert A., 278,331, Cl. D13-35.000.

Kirschling, Charles J.: *See*—
Madl, Alfred W.; and Kirschling, Charles J., 278,305, Cl. D7-352.000.

Knoll International, Inc.: *See*—
Riart, Carlos, 278,283, Cl. D6-348.000.

Kohler Co.: *See*—
Kohler, Herbert V., Jr.; and Doman, Donald W., 278,360, Cl. D23-55.000.

Kohler, Herbert V., Jr.; and Doman, Donald W., to Kohler Co. Bathtub apron. 278,360, 4-9-85, Cl. D23-55.000.

Koper, Barry R. Facial appliance for makeup. 278,357, 4-9-85, Cl. D21-190.000.

Kurokawa, Koya; and Arai, Noriyuki, to Matsushita Electric Industrial Co., Ltd. Camera for video tape recorder. 278,338, 4-9-85, Cl. D14-78.000.

Laslo, Larry R., to American Commercial, Incorporated. Fork. 278,299, 4-9-85, Cl. D7-151.000.

Laslo, Larry R., to American Commercial Incorporated. Spoon. 278,300, 4-9-85, Cl. D7-151.000.

Laslo, Larry R., to American Commercial Incorporated. Knife. 278,301, 4-9-85, Cl. D7-151.000.

Laslo, Larry R., to American Commercial Incorporated. Knife. 278,302, 4-9-85, Cl. D7-151.000.

Laslo, Larry R., to American Commercial, Incorporated. Fork. 278,303, 4-9-85, Cl. D7-151.000.

Laslo, Larry R., to American Commercial, Incorporated. Spoon. 278,304, 4-9-85, Cl. D7-151.000.

Lenci, Fabio: *See*—
Talocci, Giovanna; and Lenci, Fabio, 278,288, Cl. D6-525.000.

Levin, William; and Skyer, Kenneth. Purse alarm. 278,318, 4-9-85, Cl. D10-106.000.

Lowrey, Charles. Chair. 278,285, 4-9-85, Cl. D6-372.000.

Lowrey, Charles. Chair. 278,286, 4-9-85, Cl. D6-372.000.

Madl, Alfred W.; and Kirschling, Charles J., to Sunbeam Corporation. Waffle maker. 278,305, 4-9-85, Cl. D7-352.000.

Mahowald, John E. Rack for hanging soft cover books. 278,354, 4-9-85, Cl. D19-91.000.

Martignette, Patricia A. Zodiacal cusp medallion. 278,321, 4-9-85, Cl. D11-100.000.

Martignette, Patricia A. Zodiacal cusp medallion. 278,322. 4-9-85, Cl. D11-105.000.

Matsuda, Hari; Cascarano, Anthony J.; and Schwimmer, Charles M., to International Jensen Incorporated. Loudspeaker front panel assembly. 278,335, 4-9-85, Cl. D14-39.000.

Matsushita Electric Industrial Co., Ltd.: *See*—
Kurokawa, Koya; and Arai, Noriyuki, 278,338, Cl. D14-78.000.

McIntosh, Lois A. Microwave oven rack. 278,306, 4-9-85, Cl. D7-409.000.

McNaghten, Delmar E.; Kent, Dennis C.; and Brown, Robert A., to A. B. Chance Company. Shield and fuse contact assembly for electrical cutout. 278,331, 4-9-85, Cl. D13-35.000.

Meier, Otto; and Huber, Felix, to Cerberus A.G. Terminal for detecting, signaling and evaluating various hazard criteria, such as fire or intrusion conditions. 278,332, 4-9-85, Cl. D13-35.000.

Micro Plastics Inc.: *See*—
Hill, Royce W., 278,330, Cl. D13-24.000.

Morishita, Masayuki: *See*—
Funato, Toshiaki; Morishita, Masayuki; and Itoh, Masafumi, 278,351, Cl. D18-1.000.

Morton, Marvin H., Jr. Extendible table. 278,290, 4-9-85, Cl. D6-430.000.

Motorola, Inc.: *See*—
Scheid, William J., 278,341, Cl. D14-100.000.

Murray Ohio Manufacturing Co., The: *See*—
Breen, John D., 278,324, Cl. D12-111.000.

Nagel, Dietmar, to Nagel/Kennedy/Arad & Associates. Tricycle. 278,325, 4-9-85, Cl. D12-112.000.

Nagel/Kennedy/Arad & Associates: *See*—
Nagel, Dietmar, 278,325, Cl. D12-112.000.

Newby, James T. Hammock. 278,292, 4-9-85, Cl. D6-347.000.

Ohashi, Keitchi, to Skylight Industry Co., Ltd. Fluorescent lantern. 278,366, 4-9-85, Cl. D26-42.000.

Olivetti Synthesis, S.p.A.: *See*—
Sottsass, Ettore; and De Lucchi, Michele, 278,289, Cl. D6-487.000.

Olympus Optical Company, Ltd.: *See*—
Kawazu, Hideyuki, 278,347, Cl. D16-32.000.
Takata, Kazuaki, 278,333, Cl. D14-12.000.

Ottinger, Barbara L.: *See*—
Brown, John M.; Herritz, Donald; Ottinger, Barbara L.; and Westmas, Leland D., 278,311, Cl. D9-436.000.

Owens-Classic, Inc.: *See*—
Baker, Dennis O.; and Anderson, James E., 278,329, Cl. D12-203.000.

Ozen Corporation: *See*—
Watanabe, Katsumi, deceased, 278,334, Cl. D14-14.000.

Parks, Gerald R.: *See*—
Gregory, John R.; Parks, Gerald R.; and Dondero, John D., 278,280, Cl. D2-27.000.

Peavey Electronics Corp.: *See*—
Peavey, Hartley D.; and Powers, Michael V., 278,349, Cl. D17-20.000.

Peavey, Hartley D.; and Powers, Michael V., to Peavey Electronics Corp. Guitar body or similar article. 278,349, 4-9-85, Cl. D17-20.000.

Persosky, Richard J. Heat exchanger. 278,361, 4-9-85, Cl. D23-136.000.

Plessey Overseas Limited: *See*—
Caven, Terence T., 278,339, Cl. D14-100.000.

PMT Inc.: *See*—
Van Beek, Allen L.; and Iversen, Alfred L., 278,314, Cl. D10-53.000.

Powers, Michael V.: *See*—
Peavey, Hartley D.; and Powers, Michael V., 278,349, Cl. D17-20.000.

Primoff, Eugene H. Religious medal. 278,320, 4-9-85, Cl. D11-96.000.

Pringle, Larry E.; and Franklin, Marsha S. Hanging lighter holder with clipper. 278,369, 4-9-85, Cl. D28-60.000.

Progin, Maurice. Clock. 278,313, 4-9-85, Cl. D10-23.000.

Raiter, Leon C.: *See*—
Wenstrom, Roger A.; Holes, William W.; and Raiter, Leon C., 278,352, Cl. D19-26.000.
Rattray, Thomas, to Con-Serv Incorporated. Register fan. 278,362, 4-9-85, Cl. D23-155.000.
Riart, Carlos, to Knoll International, Inc. Rocking chair. 278,283, 4-9-85, Cl. D6-348.000.
Ricoh Company, Ltd.: *See*—
Saito, Yasuhiro; Goto, Tetsuya; and Umino, Toshio, 278,346, Cl. D16-31.000.
Roch, Gerald V., to Hurco Manufacturing Co., Inc. Gauge bar. 278,343, 4-9-85, Cl. D15-123.000.
Rosemount Inc.: *See*—
Bengtson, Darroll D., 278,316, Cl. D10-96.000.
Rousseau, Kenneth E., to Harper Truck, Inc. Hand truck. 278,373, 4-9-85, Cl. D34-26.000.
Rudd, Thomas H., to Drag Specialties, Inc. Panhead engine belt buckle. 278,282, 4-9-85, Cl. D2-394.000.
Saito, Yasuhiro; Goto, Tetsuya; and Umino, Toshio, to Ricoh Company, Ltd. Electrostatic copier. 278,346, 4-9-85, Cl. D16-31.000.
Salit, Yechiel. Block for electrical circuitry assembly kits. 278,353, 4-9-85, Cl. D19-62.000.
Scheid, William J., to Motorola, Inc. Portable terminal or similar article. 278,341, 4-9-85, Cl. D14-100.000.
Schenkel, Lotte; and Fankhauser, Peter, to ALZA Corporation. Bandage. 278,363, 4-9-85, Cl. D24-49.000.
Schuman, Eldor N. Combined holder for sliced bread and condiment containers or the like. 278,298, 4-9-85, Cl. D7-52.000.
Schwimmer, Charles M.: *See*—
Matsuda, Hari; Cascarano, Anthony J.; and Schwimmer, Charles M., 278,335, Cl. D14-39.000.
Seibel, Ben, to American Commercial, Incorporated. Wine glass. 278,296, 4-9-85, Cl. D7-13.000.
Skyer, Kenneth: *See*—
Levin, William; and Skyer, Kenneth, 278,318, Cl. D10-106.000.
Skylight Industry Co., Ltd.: *See*—
Ohashi, Keiichi, 278,366, Cl. D26-42.000.
Smith, Roger R., to Hardinge Brothers, Inc. Collet holder. 278,344, 4-9-85, Cl. D15-140.000.
Societe Teleplastics Industries S.A.: *See*—
Speitel, Francois X., 278,370, Cl. D28-91.100.
Sony Corporation: *See*—
Enomoto, Haruyuki, 278,340, Cl. D14-100.000.
Sottsass, Ettore; and De Lucchi, Michele, to Olivetti Synthesis, S.p.A. Table. 278,289, 4-9-85, Cl. D6-487.000.
Southco. Inc.: *See*—
Vickers, James H., 278,309, Cl. D8-327.000.
Spalding & Evenflo Company, Inc.: *See*—
Zwilling, Brian R., 278,358, Cl. D21-196.000.
Speitel, Francois X., to Societe Teleplastics Industries S.A. Pocket perfume atomizer. 278,370, 4-9-85, Cl. D28-91.100.
Sports Marketing, Inc.: *See*—
Vacanti, Eugene J., 278,279, Cl. D2-27.000.
Strang, Mark J. Rocker. 278,293, 4-9-85, Cl. D6-348.000.
Strickland, George B. Pet watering dish or similar article. 278,371, 4-9-85, Cl. D30-13.000.
Sugimoto, Tatsuo, to Daiwa Seiko, Inc. Fishing reel spool. 278,359, 4-9-85, Cl. D22-25.000.
Sunbeam Corporation: *See*—
Madl, Alfred W.; and Kirschling, Charles J., 278,305, Cl. D7-352.000.
Sussman, Howard. Manicure bowl. 278,367, 4-9-85, Cl. D28-61.000.
Sylvester, Gordon E.: *See*—
Girardi, Joseph; and Sylvester, Gordon E., 278,336, Cl. D14-52.000.
Takata, Kazuaki, to Olympus Optical Co., Ltd. Microphone. 278,333, 4-9-85, Cl. D14-12.000.
Talocci, Giovanna; and Lenci, Fabio, to F. LLI Guzzini S.p.A. Shower caddy. 278,288, 4-9-85, Cl. D6-525.000.
Thompson, Bruce R. Tissue box holder. 278,295, 4-9-85, Cl. D6-518.000.
Timex Corporation: *See*—
Houlihan, John T., 278,315, Cl. D10-30.000.
Umino, Toshio: *See*—
Saito, Yasuhiro; Goto, Tetsuya; and Umino, Toshio, 278,346, Cl. D16-31.000.
Vacanti, Eugene J., to Sports Marketing, Inc. Thigh protector. 278,279, 4-9-85, Cl. D2-27.000.
Valentiner, Karin E. Fingernail mold. 278,368, 4-9-85, Cl. D28-56.000.
Van Beek, Allen L.; and Iversen, Alfred L., to PMT Inc. Surgical temperature monitor and alarm system. 278,314, 4-9-85, Cl. D10-53.000.
Vickers, James H., to Southco. Inc. Hinge. 278,309, 4-9-85, Cl. D8-327.000.
Watanabe, Katsumi, deceased (by Watanabe, Shizuko, legal heir), to Ozen Corporation. Electric motor driven phonograph for internal placement in toys or the like. 278,334, 4-9-85, Cl. D14-14.000.
Watanabe, Shizuko, legal heir: *See*—
Watanabe, Katsumi, deceased, 278,334, Cl. D14-14.000.
Wenstrom, Roger A.; Holes, William W.; and Raiter, Leon C., to Holes-Webway Company, The. Diary. 278,352, 4-9-85, Cl. D19-26.000.
Westmas, Leland D.: *See*—
Brown, John M.; Herritz, Donald; Ottinger, Barbara L.; and Westmas, Leland D., 278,311, Cl. D9-436.000.
Williams, Kenneth L. Sign frame. 278,355, 4-9-85, Cl. D20-38.000.
Willis, William E. Radio mounting fairing for a motorcycle fairing. 278,327, 4-9-85, Cl. D12-114.000.
Zwilling, Brian R., to Spalding & Evenflo Company, Inc. Barbell weight. 278,358, 4-9-85, Cl. D21-196.000.

LIST OF PLANT PATENTEES

B. V. Handelskwekerij/M. C. van Staaveren: *See*—
van Andel, Jacob, 5,431, Cl. 68.000.
Baratta, Nicoletta; and Nobbio, Giacomo, to Laboratoire de Physiologie Vegetale de La Londe. Carnation named Lontarion. 5,435, 4-9-85, Cl. 73.000.
Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de La Londe. Carnation named Lontocia. 5,432, 4-9-85, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de La Londe. Carnation named Lonkorpi. 5,433, 4-9-85, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, to Laboratoire de Physiologie Vegetale de La Londe. Carnation named Lonblitec. 5,434, 4-9-85, Cl. 70.000.
Bruno Imazio Partnership: *See*—
Imazio, Bruno L., 5,430, Cl. 54.000.
Ducloux, Yves: *See*—
Barberet, Nicole; and Ducloux, Yves, 5,432, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, 5,433, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, 5,434, Cl. 70.000.
Imazio, Bruno L., to Bruno Imazio Partnership. Heather named Erica Pacifica. 5,430, 4-9-85, Cl. 54.000.
Laboratoire de Physiologie Vegetale de La Londe: *See*—
Baratta, Nicoletta; and Nobbio, Giacomo, 5,435, Cl. 73.000.
Barberet, Nicole; and Ducloux, Yves, 5,432, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, 5,433, Cl. 70.000.
Barberet, Nicole; and Ducloux, Yves, 5,434, Cl. 70.000.
Nobbio, Giacomo: *See*—
Baratta, Nicoletta; and Nobbio, Giacomo, 5,435, Cl. 73.000.
van Andel, Jacob, to B. V. Handelskwekerij/M. C. van Staaveren. Alstroemeria named Stalrama. 5,431, 4-9-85, Cl. 68.000.

CLASSIFICATION OF PATENTS

ISSUED APRIL 9, 1985

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

22 4,509,213
322 4,509,214

CLASS 4

452 4,509,215

CLASS 5

13 4,509,216
430 4,509,217
450 4,509,218
481 4,509,219

CLASS 8

539 4,509,948

CLASS 10

86 A 4,509,220

CLASS 15

29 4,509,221
104.06 R 4,509,222
160 4,509,223
244 R 4,509,224
256.51 4,509,225
257.06 4,509,226

CLASS 16

23 4,509,227
114 R 4,509,228
327 4,509,229

CLASS 19

245 4,509,230

CLASS 24

30.5 R 4,509,231
113 R 4,509,232
136 R 4,509,233

CLASS 29

25.42 4,509,234
26 A 4,509,235
4,509,236
116 AD 4,509,237
156.8 R 4,509,238
159 A 4,509,239
227 4,509,240
263 4,509,241
267 4,509,242
402.02 4,509,243
516 4,509,244
525 4,509,245
526 R 4,509,246
527.4 4,509,247
572 4,509,248
576 W 4,509,249
578 4,509,250
603 4,509,251
623.1 4,509,252
4,509,253
623.5 4,509,254
753 4,509,255
802 4,509,256
825 4,509,257
876 4,509,258

CLASS 30

34.1 4,509,259
162 4,509,260
276 4,509,261

CLASS 33

125 R 4,509,262
169 R 4,509,263
4,509,264
174 L 4,509,266
174 PA 4,509,265
185 R 4,509,267
201 4,509,268
293 4,509,269

CLASS 34

4 4,509,270
12 4,509,271
27 4,509,272
86 4,509,273
114 4,509,274
126 4,509,275

CLASS 36

115 4,509,276

CLASS 40

1.5 4,509,277
156 4,509,278
447 4,509,279
486 4,509,280

CLASS 42

1 ST 4,509,282
1 Y 4,509,281
50 4,509,283
87 4,509,284

CLASS 43

9 4,509,285
4,509,286
19.2 4,509,287
102 4,509,288

CLASS 44

51 4,509,950
53 4,509,951
57 4,509,952
4,509,953
62 4,509,954
4,509,955
68 4,509,956

CLASS 47

70 4,509,289

CLASS 48

61 4,509,957

CLASS 49

92 4,509,290
409 4,509,291
499 4,509,292
502 4,509,293
504 4,509,294

CLASS 51

49 4,509,295
148 4,509,296
181 R 4,509,297
237 R 4,509,298
4,509,299
435 4,509,300

CLASS 52

79.8 4,509,301
82 4,509,302
98 4,509,303
127.3 4,509,304
223 R 4,509,305
302 4,509,306
309.4 4,509,307
787 4,509,308

CLASS 53

142 4,509,309
170 4,509,310
202 4,509,311
375 4,509,312
570 4,509,313
586 4,509,314

CLASS 55

132 4,509,958
161 4,509,959
287 4,509,960
294 4,509,961
306 4,509,962
324 4,509,963
386 4,509,964
399 4,509,965
502 4,509,966

CLASS 56

10.7 4,509,315
250 4,509,316

CLASS 57

58.32 4,509,317
212 4,509,318
218 4,509,319
225 4,509,320
328 4,509,321
333 4,509,322

CLASS 59

8 4,509,323

CLASS 60

39.141 4,509,325
39.17 4,509,324
39.182 4,509,326
274 4,509,327
528 4,509,328
531 4,509,329
537 4,509,330
602 4,509,331
660 4,509,332
723 4,509,333

CLASS 62

6 4,509,334
17 4,509,967
76 4,509,344
77 4,509,335
112 4,509,336
235.1 4,509,337
288 4,509,338
450 4,509,339
503 4,509,340
512 4,509,341
514 R 4,509,342
4,509,343

CLASS 65

10.1 4,509,968
300 4,509,969

CLASS 68

20 4,509,345

CLASS 70

16 4,509,346
129 4,509,347
131 4,509,348
233 4,509,349
333 R 4,509,350

CLASS 71

86 4,509,970
90 4,509,971
92 4,509,972
4,509,973
100 4,509,974
4,509,975

CLASS 72

19 4,509,351
138 4,509,352
267 4,509,353
294 4,509,354
325 4,509,355
349 4,509,356
384 4,509,357
476 4,509,358

CLASS 73

23 4,509,359
61 R 4,509,360
73 4,509,361
79 4,509,362
118 4,509,363
4,509,364
151 4,509,365
457 4,509,367
624 4,509,368
628 4,509,369
705 4,509,370
861 4,509,371
861.02 4,509,366
861.28 4,509,372
4,509,373
862.17 4,509,374
862.32 4,509,375
862.56 4,509,376
4,509,377

CLASS 74

44 4,509,378
58 4,509,379
394 4,509,380
413 4,509,381
424.8 R 4,509,382
471 XY 4,509,383
473 R 4,509,384
477 4,509,385
492 4,509,386
505 4,509,387
650 4,509,388
695 4,509,389
705 4,509,390
869 4,509,391

CLASS 75

21 4,509,976
59 4,509,977
84.1 R 4,509,978
130 R 4,509,979
234 4,509,980

CLASS 81

8.1 4,509,392
121 A 4,509,393

CLASS 82

4 R 4,509,394

CLASS 83

55 4,509,395
126 4,509,396
453 4,509,397
745 4,509,398

CLASS 84

216 4,509,399
293 4,509,400

CLASS 86

48 4,509,401

CLASS 91

275 4,509,402
365 4,509,403
388 4,509,404
420 4,509,405
453 4,509,406
466 4,509,407

CLASS 92

2 4,509,408
80 4,509,409
89 4,509,410

CLASS 98

34.5 4,509,411

CLASS 99

331 4,509,412
453 4,509,413
585 4,509,414

CLASS 100

2 4,509,415
25 4,509,416
90 4,509,417
97 4,509,418
117 4,509,419

CLASS 101

35 4,509,420
93.04 4,509,421
118 4,509,422
127.1 4,509,423
177 4,509,424
216 4,509,425
348 4,509,426

CLASS 102

261 4,509,427
466 4,509,428

CLASS 104

25 4,509,429
173 R 4,509,430
250 4,509,431

CLASS 106

3 4,509,981
23 4,509,982
38.2 4,509,983
38.22 4,509,984
84 4,509,985
110 4,509,986
308 Q 4,509,987
308 R 4,509,988

CLASS 108

51.1 4,509,432
52.1 4,509,433

CLASS 110

238 4,509,434
344 4,509,435
345 4,509,436
4,509,437

CLASS 111

13 4,509,438

CLASS 112

79 R 4,509,439
153 4,509,440
158 B 4,509,441
261 4,509,442
262.1 4,509,443
4,509,444
317 4,509,445

CLASS 114

45 4,509,446
65 R 4,509,447
293 4,509,448

CLASS 116

218 4,509,449

CLASS 118

20 4,509,450
50.1 4,509,451
234 4,509,452
420 4,509,453
681 4,509,454
696 4,509,455
715 4,509,456

CLASS 119

1 4,509,457
3 4,509,458
4,509,459
74 4,509,460
103 4,509,461
117 4,509,462

CLASS 122

7 R 4,509,463

CLASS 123

1 A 4,509,464
41.02 4,509,465
52 MF 4,509,466
90.16 4,509,467
90.38 4,509,468
154 4,509,469
179 G 4,509,471
4,509,472
179 L 4,509,470
188 SC 4,509,473
192 B 4,509,474
195 A 4,509,475
266 4,509,476
339 4,509,477
4,509,478
359 4,509,480
407 4,509,481
418 4,509,482
432 4,509,483
436 4,509,484
440 4,509,485
453 4,509,486
458 4,509,487
481 4,509,488
489 4,509,489
502 4,509,490
4,509,491
525 4,509,479
569 4,509,492
602 4,509,493
609 4,509,494
643 4,509,495
651 4,509,496

CLASS 124

35 A 4,509,497

CLASS 126

288 4,509,498
292 4,509,499
425 4,509,500
439 4,509,501
440 4,509,502
452 4,509,503

CLASS 128

1 B 4,509,505
1 R 4,509,504
1.2 4,509,506
4 4,509,507
6 4,509,508
24.1 4,509,509
25 R 4,509,510
92 H 4,509,511
160 4,509,512
200.23 4,509,515
202.12 4,509,513
207.15 4,509,514
303 R 4,509,516
319 4,509,517
325 4,509,518
419 F 4,509,519
4,509,520
421 4,509,521
634 4,509,522
658 4,509,523
660 4,509,524
663 4,509,525
4,509,526
671 4,509,527
691 4,509,528
708 4,509,529
710 4,509,530
736 4,509,531
4,509,532
4,509,533
764 4,509,534
798 4,509,535

CLASS 130

30 R 4,509,536

CLASS 131

276 4,509,537

CLASS 132

9 4,509,538
53 4,509,539
79 R 4,509,540
90 4,509,541

CLASS 133

8 A 4,509,542

CLASS 134

22.12 4,509,989
57 D 4,509,543
144 4,509,544
199 4,509,545

CLASS 136

242 4,510,343
256 4,510,344

CLASS 137

74 4,509,546
85 4,509,547
99 4,509,548
327 4,509,549
551 4,509,550
554 4,509,551
557 4,509,552
596 4,509,553
614.05 4,509,554
625.11 4,509,555
884 4,509,556

CLASS 138

30 4,509,557
104 4,509,558
121 4,509,559
122 4,509,560
149 4,509,561

CLASS 139

13 R 4,509,562
443 4,509,563

CLASS 140

92.2 4,509,564

CLASS 141

39 4,509,565
94 4,509,566
97 4,509,567
129 4,509,568
360 4,509,569
390 4,509,570

CLASS 144

2 R 4,509,571
84 4,509,572
193 D 4,509,573
208 E 4,509,574

CLASS 148

1.5 4,509,990
4,509,991
6.27 4,509,992
15.5 4,509,993
24 4,509,994
143 4,509,995
171 4,509,996
175 4,509,997

CLASS 149

2 4,509,998

CLASS 152

356 R 4,509,575

CLASS 156

71 4,509,999
89 4,510,000
98 4,510,001
126 4,510,002
137 4,510,003
143 4,510,004
221 4,510,005
235 4,510,006
244.12 4,510,007
245 4,510,008
353 4,510,009
383 4,510,010
407 4,510,011
415 4,510,012
498 4,510,013
522 4,510,014
617 R 4,510,015
643 4,510,016
651 4,510,017
666 4,510,018

CLASS 160

66 4,509,576
328 4,509,577

CLASS 162

141 4,510,019
169 4,510,020

CLASS 164

155 4,509,578
159 4,509,579
445 4,509,580
479 4,509,581
486 4,509,582

CLASS 165

4 4,509,583
10 4,509,584
12 4,509,585
29 4,509,586
61 4,509,587
80 R 4,509,588
95 4,509,589
104.27 4,509,590
122 4,509,591
166 4,509,592

CLASS 166

63 4,509,593
208 4,509,594
261 4,509,595
263 4,509,596
274 4,509,597
308 4,509,598
370 4,509,599
381 4,509,600

CLASS 169

61 4,509,601

CLASS 172

311 4,509,602
427 4,509,603

CLASS 174

35 R 4,510,345
36 4,510,346
68.5 4,510,347
121 A 4,510,348

CLASS 175

4.52 4,509,604
57 4,509,605
69 4,509,606
227 4,509,607

CLASS 177

1 4,509,608
4,509,609
211 4,509,610

CLASS 179

2 A 4,510,349
5 P 4,510,350
27 D 4,510,351

CLASS 180

79.1 4,509,611
89.14 4,509,612
219 4,509,613
273 4,509,614

CLASS 181

148 4,509,615
214 4,509,616

CLASS 182

93 4,509,617

CLASS 184

6.4 4,509,618

CLASS 188

73.39 4,509,619
171 4,509,620
372 4,509,621

CLASS 190

119 4,509,622

CLASS 191

64 4,510,352

CLASS 192

0.033 4,509,625
0.094 4,509,628
0.096 Re.31,861
0.098 4,509,629
4 A 4,509,623
4,509,624
85 AA 4,509,626
85 F 4,509,627

CLASS 194

1 A 4,509,631
1 G 4,509,630
4 D 4,509,632
100 A 4,509,633

CLASS 198

347 4,509,634
365 4,509,635
372 4,509,636
472 4,509,637
486 4,509,638

CLASS 200

5 A 4,510,353
11 R 4,510,354
47 4,510,355
48 R 4,510,356
50 R 4,510,357
81 R 4,510,358
144 AP 4,510,359
151 4,510,360

CLASS 201

4 4,510,021

CLASS 203

51 4,510,022
99 4,510,023

CLASS 204

59 R 4,510,024
78 4,510,025
95 4,510,026
110 4,510,027
119 4,510,028
130 4,510,029
147 4,510,030
159.20 4,510,031
197 4,510,032
245 4,510,033
290 F 4,510,034
411 4,510,035
425 4,510,036

CLASS 206

159 4,509,639
175 4,509,640
219 4,509,641
4,509,642
315.8 4,509,643
461 4,509,644
545 4,509,645

CLASS 208

B LE 4,510,037
10 4,510,038
4,510,039
4,510,040
48 AA 4,510,041
59 4,510,042
97 4,510,043
111 4,510,044
4,510,045
254 H 4,510,046
321 4,510,047

CLASS 209

3 4,510,048
4,510,049
167 4,510,050
573 4,509,646

CLASS 210

94 4,510,051
139 4,510,052
175 4,510,053
242.3 4,510,054
500.1 4,510,055
512.1 4,510,056
612 4,510,057
657 4,510,058
701 4,510,059
746 4,510,060
769 4,510,061

CLASS 211

41 4,509,647
60.1 4,509,650
70.6 4,509,648
4,509,649
4,509,651
126 4,509,652

CLASS 215

231 4,509,653
253 4,509,654
309 4,509,655

CLASS 219

10.55 A 4,510,361
10.55 E 4,510,362
10.71 4,510,363
69 G 4,510,364
4,510,365
69 M 4,510,366
4,510,368
69 W 4,510,367
86.25 4,510,370
121 LM 4,510,371
125.11 4,510,372
137.71 4,510,373
146.1 4,510,374
328 4,510,375
389 4,510,369
492 4,510,376
550 4,510,377

CLASS 220

8 4,509,656
436 4,509,657

CLASS 221

115 4,509,658

CLASS 222

41 4,509,659
107 4,509,660
190 4,509,661
391 4,509,662
400.7 4,509,663
402 4,509,664
478 4,509,665

CLASS 223

39 4,509,666

CLASS 224

250 4,509,667

CLASS 227

8 4,509,668
130 4,509,669

CLASS 228

34 4,509,670
157 4,509,671
175 4,509,672
212 4,509,673

CLASS 229

23 R 4,509,674

CLASS 232

17 4,509,675
43.4 4,509,676

CLASS 235

50 R 4,510,378
95 C 4,510,379
379 4,510,380
4,510,381
380 4,510,382
462 4,510,383

CLASS 236

49 4,509,678
94 4,509,679
122 4,509,677

CLASS 237

2 B 4,509,680
53 4,509,681

CLASS 239

60 4,509,682
77 4,509,683
112 4,509,684
186 4,509,685
239 4,509,686
245 4,509,687
338 4,509,688
407 4,509,689
429 4,509,690
533.9 4,509,691
542 4,509,692
585 4,509,693
697 4,509,694

CLASS 241

2 4,509,695
15 4,509,696
41 Re.31,862
72 4,509,697
169.1 4,509,698
268 4,509,699
280 4,509,700
292 4,509,701

CLASS 242

18 G 4,509,702
59 4,509,703
84.2 A 4,509,704
84.21 R 4,509,705
107.4 A 4,509,706
4,509,707
107.7 4,509,708

CLASS 244

118.1 4,509,709

CLASS 248

73 4,509,710
235 4,509,711
464 4,509,712
546 4,509,713
618 4,509,714

CLASS 250

201 4,510,384
203 R 4,510,385
251 4,510,386
309 4,510,387
327.2 4,510,388
339 4,510,389
341 4,510,390
374 4,510,391
475.2 4,510,392
4,510,393
483.1 4,510,394

CLASS 251

138 4,509,715
141 4,509,716
144 4,509,717
163 4,509,718
214 4,509,719
308 4,509,720
335 B 4,509,721
359 4,509,722

CLASS 252

45 4,510,062
51.5 R 4,510,063
67 4,510,064
106 4,510,065
140 4,510,066
174.21 4,510,067
186.29 4,510,068
299.61 4,510,069
351 4,510,070
373 4,510,071
380 4,510,072
383 4,510,073
400.23 4,510,074
500 4,510,075
4,510,076
502 4,510,077
510 4,510,078
511 4,510,079
522 R 4,510,080
603 4,510,081

CLASS 254

93 H 4,509,723
126 4,509,724
212 4,509,725

CLASS 256

8 4,509,726

CLASS 260

112 B 4,510,084
112.5 E 4,510,085
112.5 R 4,510,082
4,510,083
239 A 4,510,086
371 4,510,087
380 4,510,088
396 N 4,510,089
396 R 4,510,090
409 4,510,091
4,510,092
410.9 N 4,510,093
429 CY 4,510,094
429.7 4,510,095
439 R 4,510,096
453 A 4,510,097
465 D 4,510,098
465.5 R 4,510,099
508 4,510,100
928 4,510,101
941 4,510,102

CLASS 264

40.2 4,510,103
40.7 4,510,104
46.6 4,510,105
53 4,510,106
65 4,510,107
119 4,510,108
151 4,510,109
176 R 4,510,110
177 F 4,510,111
234 4,510,112
257 4,510,113
261 4,510,114
515 4,510,115
529 4,510,116

CLASS 266

44 4,509,727
4,509,728
252 4,509,729

CLASS 267

35 4,509,730

CLASS 269

78 4,509,731

CLASS 270

37 4,509,732
41 4,509,733

CLASS 271

10 4,509,734
11 4,509,735
4,509,736
125 4,509,737
160 4,509,738
176 4,509,739
224 4,509,740

CLASS 272

69 4,509,741
73 4,509,742
97 4,509,743
116 4,509,744
130 4,509,745
134 4,509,746
136 4,509,747
145 4,509,748

CLASS 273

29 BA 4,509,749
29A 4,509,750
32 H 4,509,751
49 4,509,752
110 4,509,753
142 J 4,509,754
144 B 4,509,755
153 S 4,509,756
186 A 4,509,757
240 4,509,758
269 4,509,759
380 4,509,760
417 4,509,761

CLASS 277

81 R 4,509,762
82 4,509,773
163 4,509,763
166 4,509,764

CLASS 279

50 4,509,765

CLASS 280

21 R 4,509,766
289 R 4,509,767
479 R 4,509,768
491 R 4,509,769
507 4,509,770
609 4,509,771
661 4,509,772
694 4,509,774
779 4,509,775

CLASS 285

55 4,509,776
286 4,509,777
406 4,509,778

CLASS 290

3 4,510,395
30 R 4,510,396
43 4,510,397

CLASS 292

254 4,509,779
307 R 4,509,780

CLASS 293

104 4,509,781
121 4,509,782

CLASS 294

88 4,509,783
99.1 4,509,784
118 4,509,785

CLASS 296

1 S 4,509,786
3 4,509,787
24 R 4,509,788
37.2 4,509,789
204 4,509,790
216 4,509,791

CLASS 297

180 4,509,792
355 4,509,793
434 4,509,795
440 4,509,794
452 4,509,796
466 4,509,797
487 4,509,798

CLASS 299

42 4,509,799

CLASS 303

6 C 4,509,800
8 4,509,801
110 4,509,802

CLASS 307

35 4,510,398
57 4,510,399
66 4,510,400
4,510,401
427 4,510,402

CLASS 308

5 R 4,509,803

CLASS 310

36 4,510,403
50 4,510,404
76 4,510,405
99 4,510,406
154 4,510,407
168 4,510,408
268 4,510,409
313 D 4,510,410
316 4,510,411
328 4,510,412

CLASS 312

210 4,509,805
257 SK 4,509,806

CLASS 313

460 4,510,413
468 4,510,414
493 4,510,415
579 4,510,416
585 4,510,417

CLASS 315

73 4,510,418
241 P 4,510,419

CLASS 318

37 4,510,420
135 4,510,421
254 4,510,422
331 4,510,423
432 4,510,424
484 4,510,425
565 4,510,426
590 4,510,427
632 4,510,428
696 4,510,266
4,510,429
800 4,510,430

CLASS 320

1 4,510,431
4,510,432

CLASS 322

32 4,510,433

CLASS 323

237 4,510,434

CLASS 324

52 4,510,435
61 P 4,510,436
61 R 4,510,437
71.4 4,510,438
73 AT 4,510,439
77 G 4,510,440
96 4,510,441
99 R 4,510,442
120 4,510,443
121 R 4,510,444
158 F 4,510,445
158 R 4,510,446
225 4,510,447
309 4,510,448
4,510,449
321 4,510,450

CLASS 328

130.1 4,510,451
144 4,510,452

CLASS 329

106 4,510,453

CLASS 330

2 4,510,454
4.3 4,510,455

10 4,510,456
4,510,457
260 4,510,458
265 4,510,459
285 4,510,460

CLASS 331

1 A 4,510,461
4,510,462
15 4,510,463
116 R 4,510,464

CLASS 332

16 T 4,510,465
31 R 4,510,466
4,510,467

CLASS 333

12 4,510,468
21 R 4,510,469
142 4,510,470
195 4,510,471
262 4,510,472

CLASS 335

86 4,510,473

CLASS 336

30 4,510,474
60 4,510,475
84 C 4,510,476
92 4,510,477
198 4,510,478

CLASS 337

91 4,510,479
321 4,510,480
368 4,510,481

CLASS 338

24 4,510,482
80 4,510,483

CLASS 339

9 R 4,509,807
14 R 4,509,809
17 F 4,509,811
17 M 4,509,810
17 R 4,509,808
75 M 4,509,812
91 R 4,509,813
93 R 4,509,814
147 P 4,509,815
177 R 4,509,816

CLASS 340

58 4,510,484
323 R 4,510,485
347 DA 4,510,486
566 4,510,487
567 4,510,488
572 4,510,489
4,510,490
792 4,510,491
825.05 4,510,492
4,510,493
4,510,494
825.54 4,510,495

CLASS 343

5 BD 4,510,496
5 EM 4,510,497
435 4,510,498
456 4,510,499
708 4,510,500
742 4,510,501
880 4,510,502

CLASS 346

75 4,510,503
4,510,504
76 PH 4,510,505
4,510,506
4,510,507
135.1 4,510,508
140 R 4,510,509
4,510,510
4,510,511
209 4,510,512
214 4,510,513

CLASS 350

3.61 4,509,817
3.76 4,509,818
6.7 4,509,819
96.21 4,509,820
96.23 4,509,821
128 4,509,822
4,509,823
167 4,509,824
259 4,509,825
286 4,509,826
320 4,509,827
333 4,509,828
358 4,509,829
394 4,509,830
410 4,509,831
420 4,509,832
427 4,509,833
521 4,509,834

CLASS 352

43 4,509,835
200 4,509,836

CLASS 353

10 4,509,837

CLASS 354

62 4,509,838
400 4,509,840
4,509,841
402 4,509,842
412 4,509,843
416 4,509,844
420 4,509,845
442 4,509,846
4,509,847
473 4,509,848
479 4,509,849

CLASS 355

4 4,509,850
14 C 4,509,851
30 4,509,852
35 4,509,853
38 4,509,854

CLASS 356

72 4,509,855
246 4,509,856
346 4,509,857
358 4,509,858
446 4,509,859

CLASS 357

17 4,510,514
4,510,515
23.1 4,510,516
34 4,510,517
49 4,510,518
81 4,509,839
4,510,519

CLASS 358

12 4,510,520
27 4,510,521
31 4,510,522
75 4,510,523
80 4,510,524
88 4,510,525
108 4,510,526
141 Re.31,863
158 4,510,527
213 4,510,528
224 4,510,529
314 4,510,530
342 4,510,531
4,510,532

CLASS 360

10.2 4,510,533
10.3 4,510,534
14.2 4,510,535
65 4,510,536
78 4,510,537
84 4,510,538
92 4,510,539
93 4,510,540
97 4,510,541
98 4,510,542
106 4,510,543
114 4,510,544
128 4,510,545
133 4,510,546

CLASS 361

22 4,510,547
25 4,510,548
86 4,510,549
152 4,510,550
398 4,510,551
413 4,510,552
4,510,553
433 4,510,554

CLASS 362

32 4,510,555
184 4,510,556
188 4,510,557
263 4,510,558
269 4,510,559
299 4,510,560
399 4,510,561

CLASS 363

19 4,510,562
20 4,510,563
23 4,510,564

CLASS 364

136 4,510,565
190 4,510,566
300 4,510,567
4,510,568
431.12 4,510,569
476 4,510,570
487 4,510,571
489 4,510,572
498 4,510,573
513 4,510,574
518 4,510,575
551 4,510,576
563 4,510,577
725 4,510,578
728 4,510,579
900 4,510,580
4,510,581
4,510,582
4,510,583

CLASS 365

203 4,510,584

CLASS 366

99 4,509,860
131 4,509,861
158 4,509,862
162 4,509,863

CLASS 367

43 4,510,585
87 4,510,586
118 4,510,587
165 4,510,588

CLASS 368

108 4,509,864
134 4,509,865
296 4,509,866
321 4,509,867

CLASS 369

11 4,510,589
63 4,510,590
77.1 4,510,591
270 4,510,592
283 4,510,593

CLASS 370

15 4,510,594
32 4,510,595
50 4,510,598
58 4,510,596
66 4,510,597
85 4,510,599
94 4,510,600
110.3 4,510,601

CLASS 371

20 Re.31,864
21 4,510,602
4,510,603

CLASS 372

4 4,510,604
23 4,510,605
25 4,510,606
49 4,510,607
87 4,510,608

CLASS 373

110 4,510,609
118 4,510,610

CLASS 374

141 4,509,868

CLASS 375

8 4,510,611
106 4,510,612

CLASS 376

257 4,510,117
282 4,510,118

CLASS 378

152 4,510,613

CLASS 381

16 4,510,614

CLASS 382

7 4,510,615
8 4,510,616
33 4,510,617
54 4,510,618
57 4,510,619

CLASS 383

14 4,510,620
89 4,510,621

CLASS 384

99 4,509,804
296 4,509,870
462 4,509,869
502 4,509,871

CLASS 400

144.1 4,509,872
489 4,509,873
691 4,509,874

CLASS 401

34 4,509,875
217 4,509,876

CLASS 403

41 4,509,877
71 4,509,878
172 4,509,879
179 4,509,880
229 4,509,881
402 4,509,882

CLASS 405

232 4,509,883
269 4,509,884

CLASS 407

1 4,509,885
102 4,509,886

CLASS 408

239 R 4,509,887

CLASS 410

105 4,509,888

CLASS 411

19 4,509,889
337 4,509,890

CLASS 414

113 4,509,891
223 4,509,892
280 4,509,893
555 4,509,894
685 4,509,895

CLASS 415

9 4,509,896
113 4,509,897

CLASS 416

2 4,509,898
99 4,509,899
198 A 4,509,900

CLASS 417

18 4,509,901
216 4,509,902
464 4,509,903
568 4,509,904

CLASS 418

75 4,509,905
152 4,509,906

CLASS 422

71 4,510,119
133 4,510,120
232 4,510,121

CLASS 423

10 4,510,122
360 4,510,123
437 4,510,124

CLASS 424

1.1 4,510,125
3 4,510,126
52 4,510,127
79 4,510,128
86 4,510,129
105 4,510,131

CLASS 425

197 4,509,907
290 4,509,908
388 4,509,909
451.9 4,509,910
532 4,509,911

CLASS 426

124 4,510,162
241 4,510,163
331 4,510,164
439 4,510,165
565 4,510,166
607 4,510,167

CLASS 427

3 4,510,168
4 4,510,169
33 4,510,170
34 4,510,171
38 4,510,172
44 4,510,173
65 4,510,174
79 4,510,175
82 4,510,176
85 4,510,177
94 4,510,178
96 4,510,179
136 4,510,180
142 4,510,181
162 4,510,182
185 4,510,183
212 4,510,184
222 4,510,185
381 4,510,186
429 4,510,187

CLASS 428

1 4,510,188
19 4,510,189
34 4,510,190
36 4,510,191
151 4,510,192
196 4,510,193
212 4,510,194
215 4,510,195
220 4,510,196
4,510,197
246 4,510,198
248 4,510,199
252 4,510,200
285 4,510,201
295 4,510,202
425.9 4,510,203
463 4,510,204
483 4,510,205
488.1 4,510,206
607 4,510,207
624 4,510,208
659 4,510,209

CLASS 429

11 4,510,210
18 4,510,211
30 4,510,212
36 4,510,213
43 4,510,214
99 4,510,215
101 4,510,216
104 4,510,217
198 4,510,218
212 4,510,219
225 4,510,220

CLASS 430

1 4,510,221
5 4,510,222
44 4,510,223
57 4,510,224
126 4,510,225
144 4,510,226
175 4,510,227
204 4,510,228
265 4,510,229
273 4,510,230
312 4,510,231
494 4,510,232
527 4,510,233
557 4,510,234
574 4,510,235
619 4,510,236
621 4,510,237
627 4,510,238

CLASS 431

76 4,509,912
90 4,509,913
121 4,509,914
215 4,509,915
273 4,509,916

CLASS 432

75 4,509,917

CLASS 433

5 4,509,918
57 4,509,919

CLASS 434

159 4,509,920
253 4,509,921
322 4,509,922

CLASS 435

7 4,510,239
4,510,240
23 4,510,241
157 4,510,242
167 4,510,243
172.2 4,510,244
172.3 4,510,245
183 4,510,246
207 4,510,247
226 4,510,248
289 4,510,249

CLASS 436

63 4,510,250
536 4,510,251

CLASS 440

43 4,509,923
51 4,509,924
67 4,509,925
89 4,509,926
4,509,927

CLASS 445

27 4,509,928

CLASS 446

102 4,509,929
109 4,509,930
462 4,509,931

CLASS 455

67 4,510,622
181 4,510,623
223 4,510,624

CLASS 464

109 4,509,932

CLASS 474

93 4,509,933
136 4,509,934
138 4,509,935
148 4,509,936
213 4,509,937
264 4,509,938

CLASS 493

444 4,509,939

CLASS 494

16 4,509,940
45 4,509,941
53 4,509,942

CLASS 501

35 4,510,252
95 4,510,253
146 4,510,254

CLASS 502

10 4,510,255
62 4,510,256
63 4,510,257
209 4,510,258
4,510,259
219 4,510,260
304 4,510,261
4,510,262
314 4,510,263
328 4,510,264
330 4,510,265

CLASS 514

2 4,510,130
11 4,510,132
27 4,510,134
30 4,510,133
54 4,510,161
56 4,510,135
63 4,510,136
80 4,510,137
206 4,510,138
220 4,510,153
234 4,510,139
250 4,510,141
4,510,143
255 4,510,142
4,510,322
257 4,510,144
276 4,510,155
312 4,510,146
314 4,510,147
321 4,510,152
338 4,510,150
340 4,510,148
341 4,510,149
4,510,151
365 4,510,154
411 4,510,157
415 4,510,145
4,510,156
4,510,158
456 4,510,159
521 4,510,160
530 4,510,323

CLASS 518

715 4,510,267

CLASS 521

146 4,510,268
166 4,510,269

CLASS 523

176 4,510,270
346 4,510,271
400 4,510,272
406 4,510,273
411 4,510,274
412 4,510,275
427 4,510,276
454 4,510,277

CLASS 524

14 4,510,278
144 4,510,279
178 4,510,280
229 4,510,281
337 4,510,282
356 4,510,283
379 4,510,284
401 4,510,285

CLASS 525

71 4,510,286
84 4,510,287
111 4,510,288

CLASSIFICATION OF PATENTS

148	4,510,289
162	4,510,290
237	4,510,291
247	4,510,292
338	4,510,293
369	4,510,294
437	4,510,295
534	4,510,296
537	4,510,297
CLASS 526	
87	4,510,298
129	4,510,299
247	4,510,300
254	4,510,301
264	4,510,302
282	4,510,303
CLASS 528	
481	4,510,304
494	4,510,305
CLASS 536	
127	4,510,306
CLASS 544	
283	4,510,307
360	4,510,140
CLASS 546	
85	4,510,308
194	4,510,309
321	4,510,310
CLASS 548	
132	4,510,311
194	4,510,312
	4,510,313
262	4,510,314
455	4,510,315
555	4,510,316
CLASS 549	
343	4,510,317
CLASS 560	
147	4,510,318
231	4,510,319
265	4,510,320
CLASS 562	
421	4,510,321
CLASS 564	
82	4,510,324
89	4,510,325
132	4,510,326
CLASS 568	
1	4,510,327
32	4,510,328
310	4,510,329
403	4,510,330
450	4,510,331
454	4,510,332
617	4,510,333
643	4,510,334
683	4,510,335
697	4,510,336
734	4,510,337
766	4,510,338
863	4,510,339
884	4,510,340
CLASS 570	
229	4,510,341
CLASS 585	
524	4,510,342
CLASS 586	
558	4,509,949
CLASS 604	
31	4,509,943
53	4,509,944
164	4,509,945
246	4,509,946
266	4,509,947

CLASSIFICATION OF DESIGNS

D2—	27	278,279
		278,280
	314	278,281
	394	278,282
D6—	328	278,291
	347	278,292
	348	278,283
		278,284
		278,293
	372	278,285
		278,286
	381	278,287
	430	278,290
	477	278,294
	487	278,289
	518	278,295
	525	278,288
D7—	13	278,296
	24	278,297
	52	278,298
	151	278,299
		278,300
		278,301
		278,302
		278,303
		278,304
	352	278,305
	409	278,306
D8—	21	278,310
	34	278,307
	73	278,308
	327	278,309
D9—	436	278,311
	449	278,312
D10—	23	278,313
	30	278,315
	53	278,314
	96	278,316
	101	278,317
	106	278,318
	114	278,319
D11—	96	278,320
	100	278,321
	105	278,322
	155	278,323
D12—	111	278,324
	112	278,325
	114	278,327
	194	278,328
	194	278,326
	203	278,329
D13—	24	278,330
	35	278,331
		278,332
D14—	12	278,333
	14	278,334
	39	278,335
	52	278,336
	58	278,337
	78	278,338
	100	278,339
		278,340
		278,341
D15—	88	278,342
	123	278,343
	140	278,344
	199	278,345
D16—	31	278,346
	32	278,347
	135	278,348
D17—	20	278,349
D18—	1	278,350
		278,351
D19—	26	278,352
	62	278,353
	91	278,354
D20—	38	278,355
D21—	141	278,356
	190	278,357
	196	278,358
D22—	25	278,359
D23—	55	278,360
	136	278,361
	155	278,362
D24—	49	278,363
D25—	15	278,364
D26—	28	278,365
	42	278,366
D28—	56	278,368
	60	278,369
	61	278,367
	91.1	278,370
D30—	13	278,371
	14	278,372
D34—	26	278,373
D99—	99	278,374

CLASSIFICATION OF PLANTS

P.—	54	5,430
	68	5,431
	70	5,432
		5,433
		5,434
	73	5,435

GEOGRAPHICAL INDEX
OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

01 : 4,509,574
4,509,652
4,509,897
4,509,662
02 : 4,509,301
4,509,663
04 : 4,509,214
4,509,671
4,509,298
4,509,678
4,509,570
4,509,682
4,509,621
4,509,688
4,509,667
4,509,695
4,509,709
4,509,741
4,509,726
4,509,749
4,509,819
4,509,758
4,509,926
4,509,760
4,510,010
4,509,773
4,510,015
4,509,774
4,510,178
4,509,784
4,510,436
4,509,808
4,510,472
4,509,814
4,510,519
4,509,827
05 : 4,509,890
4,509,834
06 : 4,509,218
4,509,836
4,509,251
4,509,853
4,509,254
4,509,860
4,509,270
4,509,877
4,509,277
4,509,879
4,509,281
4,509,901
4,509,289
4,509,903
4,509,290
4,509,904
4,509,296
4,509,929
4,509,304
4,509,930
4,509,325
4,509,931
4,509,349
4,509,970
4,509,350
4,509,974
4,509,365
4,509,975
4,509,370
4,509,990
4,509,372
4,509,994
4,509,373
4,510,017
4,509,379
4,510,038
4,509,398
4,510,072
4,509,414
4,510,081
4,509,423
4,510,105
4,509,427
4,510,123
4,509,461
4,510,165
4,509,501
4,510,198
4,509,509
4,510,211
4,509,519
4,510,219
4,509,528
4,510,239
4,509,543
4,510,244
4,509,551
4,510,245
4,509,571
4,510,256
4,509,580
4,510,344
4,509,587
4,510,347
4,509,615
4,510,368
4,509,637
4,510,377
4,510,385
4,510,393
4,510,402
4,510,429
4,510,445
4,510,455
4,510,459
4,510,466
4,510,467
4,510,499
4,510,516
4,510,529
4,510,536
4,510,542
4,510,549
4,510,553
4,510,556
4,510,566
4,510,590
4,510,603
4,510,605
4,510,607
4,510,622
08 : 4,509,283
4,509,451
4,509,503
4,509,555
4,509,589
4,509,763
4,509,921
4,510,108
4,510,397
4,510,596
09 : 4,509,299
4,509,341
4,509,390
4,509,486
4,509,518
4,509,527
4,509,545
4,509,548
4,509,616
4,509,644
4,509,648
4,509,675
4,509,765
4,509,780
4,509,783
4,509,795
4,509,940
4,509,964
4,509,969
4,510,053
4,510,250
4,510,308
4,510,313
4,510,378
4,510,428
4,510,488
4,510,611
10 : 4,509,223
4,509,821
4,510,136
4,510,202
4,510,237
4,510,286
4,510,300
4,510,301
12 : 4,509,253
4,509,316
4,509,332
4,509,362
4,509,393
4,509,401
4,509,435
4,509,517
4,509,521
4,509,560
4,509,670
4,509,744
4,510,438
4,510,453
4,510,465
4,510,518
4,510,526
13 : 4,509,367
4,509,392
4,509,439
4,509,603
4,509,633
4,509,728
4,510,242
4,510,254
4,510,346
4,510,348
4,510,360
4,510,539
15 : 4,509,285
4,509,599
16 : 4,509,400
4,510,021
4,510,431
17 : Re.31,861
4,509,224
4,509,275
4,509,344
4,509,406
4,509,416
4,509,460
4,509,464
4,509,602
4,509,626
4,509,631
4,509,646
4,509,649
4,509,725
4,509,735
4,509,745
4,509,767
4,509,787
4,509,813
4,509,884
4,509,891
4,509,924
4,509,946
4,509,963
4,510,005
4,510,055
4,510,061
4,510,085
4,510,091
4,510,092
4,510,212
4,510,251
4,510,259
4,510,299
4,510,339
4,510,398
4,510,400
4,510,433
4,510,456
4,510,462
4,510,478
4,510,559
4,510,594
4,510,621
4,510,624
18 : 4,509,356
4,509,484
4,509,553
4,509,742
4,509,804
4,510,082
4,510,104
4,510,247
4,510,547
19 : 4,509,284
4,509,403
4,509,588
20 : 4,509,412
21 : 4,509,216
4,509,335
4,509,394
4,509,687
4,509,928
4,510,362
4,510,416
22 : 4,509,286
4,509,534
4,509,593
4,509,600
4,509,605
4,509,617
4,509,696
4,509,883
4,509,899
4,509,951
4,510,027
4,510,065
4,510,067
4,510,078
4,510,280
24 : 4,509,300
4,509,324
4,509,522
4,509,624
4,510,097
4,510,164
4,510,261
4,510,262
4,510,263
4,510,304
4,510,327
4,510,476
4,510,479
25 : 4,509,238
4,509,248
4,509,302
4,509,346
4,509,360
4,509,449
4,509,632
4,509,639
4,509,674
4,509,698
4,509,840
4,509,980
4,510,016
4,510,018
4,510,075
4,510,076
4,510,131

4,510,175
4,510,197
4,510,206
4,510,214
4,510,220
4,510,232
4,510,287
4,510,289
4,510,294
4,510,369
4,510,392
4,510,418
4,510,463
4,510,487
4,510,496
4,510,551
4,510,575
4,510,581
4,510,609
26 : 4,509,239
4,509,241
4,509,266
4,509,272
4,509,313
4,509,340
4,509,358
4,509,386
4,509,389
4,509,465
4,509,471
4,509,473
4,509,478
4,509,483
4,509,497
4,509,516
4,509,532
4,509,544
4,509,556
4,509,567
4,509,578
4,509,579
4,509,581
4,509,611
4,509,620
4,509,672
4,509,676
4,509,681
4,509,684
4,509,706
4,509,714
4,509,727
4,509,740
4,509,770
4,509,772
4,509,775
4,509,781
4,509,782
4,509,786
4,509,789
4,509,794
4,509,818
4,509,829
4,509,909
4,509,941
4,509,952
4,509,966
4,510,101
4,510,107
4,510,109
4,510,208
4,510,210
4,510,306
4,510,365

4,510,403
4,510,408
4,510,426
4,510,616
27 : 4,509,225
4,509,227
4,509,252
4,509,267
4,509,273
4,509,303
4,509,402
4,509,428
4,509,506
4,509,512
4,509,664
4,509,690
4,509,766
4,509,880
4,509,910
4,509,947
4,509,960
4,509,965
4,509,976
4,510,048
4,510,049
4,510,064
4,510,094
4,510,114
4,510,127
4,510,236
4,510,576
4,510,593
28 : 4,509,934
29 : 4,509,533
4,509,746
4,509,759
4,509,825
4,509,933
4,509,935
4,509,938
4,510,003
4,510,171
4,510,241
4,510,285
30 : 4,510,022
4,510,124
4,510,162
31 : 4,509,361
32 : 4,509,462
4,509,885
4,510,187
33 : 4,509,333
4,509,458
4,509,459
4,509,564
4,510,223
4,510,225
4,510,272
4,510,550
34 : 4,509,215
4,509,228
4,509,242
4,509,415
4,509,420
4,509,444
4,509,447
4,509,513
4,509,554
4,509,566
4,509,630
4,509,647
4,509,650
4,509,956

4,509,973
4,510,037
4,510,043
4,510,044
4,510,045
4,510,066
4,510,080
4,510,083
4,510,096
4,510,134
4,510,166
4,510,258
4,510,260
4,510,265
4,510,295
4,510,317
4,510,319
4,510,321
4,510,340
4,510,351
4,510,357
4,510,370
4,510,376
4,510,390
4,510,417
4,510,469
4,510,489
4,510,490
4,510,500
4,510,501
4,510,514
4,510,522
4,510,564
4,510,579
4,510,595
35 : 4,510,117
4,510,451
36 : Re.31,863
4,509,255
4,509,260
4,509,279
4,509,323
4,509,345
4,509,371
4,509,378
4,509,418
4,509,432
4,509,499
4,509,502
4,509,520
4,509,530
4,509,535
4,509,539
4,509,591
4,509,641
4,509,651
4,509,712
4,509,720
4,509,753
4,509,755
4,509,798
4,509,801
4,509,826
4,509,839
4,509,850
4,509,851
4,509,858
4,509,920
4,509,937
4,509,959
4,509,991
4,510,000
4,510,063

4,510,077
4,510,130
4,510,139
4,510,144
4,510,151
4,510,158
4,510,172
4,510,200
4,510,213
4,510,276
4,510,309
4,510,354
4,510,561
4,510,582
4,510,583
4,510,599
37 : 4,509,221
4,509,442
4,509,452
4,509,597
4,509,710
4,509,888
4,510,615
39 : 4,509,233
4,509,243
4,509,244
4,509,261
4,509,265
4,509,282
4,509,493
4,509,547
4,509,585
4,509,619
4,509,717
4,509,730
4,509,817
4,509,835
4,509,881
4,509,895
4,509,896
4,509,908
4,509,911
4,509,912
4,509,922
4,509,932
4,509,949
4,509,955
4,509,967
4,509,981
4,510,001
4,510,059
4,510,125
4,510,204
4,510,221
4,510,252
4,510,320
4,510,342
4,510,356
4,510,399
4,510,484
4,510,525
4,510,565
40 : 4,509,247
4,509,450
4,509,598
4,509,705
4,510,046
4,510,050
4,510,116
4,510,297
4,510,316
4,510,337
41 : 4,509,268

42 : 4,509,258
4,509,280
4,509,327
4,509,377
4,509,387
4,509,541
4,509,561
4,509,573
4,509,654
4,509,679
4,509,702
4,509,748
4,509,778
4,509,797
4,509,805
4,509,862
4,509,989
4,510,023
4,510,033
4,510,040
4,510,119
4,510,155
4,510,176
4,510,189
4,510,230
4,510,253
4,510,267
4,510,298
4,510,322
4,510,324
4,510,333
4,510,352
4,510,359
4,510,372
4,510,446
4,510,477
4,510,502
4,510,604
44 : 4,510,153
45 : 4,509,338
4,509,399
4,509,855
4,510,199
4,510,404
47 : 4,509,536
4,509,713
4,509,856
4,510,006
4,510,112
4,510,121
4,510,205
4,510,358
4,510,363
48 : Re.31,864
4,509,222
4,509,288
4,509,329
4,509,343
4,509,347
4,509,375
4,509,405
4,509,429
4,509,443
4,509,446

4,509,409
4,509,511
4,509,854
4,509,886
4,510,361
4,510,461
4,510,482
4,510,571
4,509,258
4,509,280
4,509,327
4,509,377
4,509,387
4,509,541
4,509,561
4,509,573
4,509,654
4,509,679
4,509,702
4,509,748
4,509,778
4,509,797
4,509,805
4,509,862
4,509,989
4,510,023
4,510,033
4,510,040
4,510,119
4,510,155
4,510,176
4,510,189
4,510,230
4,510,253
4,510,267
4,510,298
4,510,322
4,510,324
4,510,333
4,510,352
4,510,359
4,510,372
4,510,446
4,510,477
4,510,502
4,510,604
44 : 4,510,153
45 : 4,509,338
4,509,399
4,509,855
4,510,199
4,510,404
47 : 4,509,536
4,509,713
4,509,856
4,510,006
4,510,112
4,510,121
4,510,205
4,510,358
4,510,363
48 : Re.31,864
4,509,222
4,509,288
4,509,329
4,509,343
4,509,347
4,509,375
4,509,405
4,509,429
4,509,443
4,509,446

4,509,448
4,509,468
4,509,552
4,509,577
4,509,590
4,509,594
4,509,596
4,509,604
4,509,606
4,509,607
4,509,636
4,509,747
4,509,777
4,510,041
4,510,057
4,510,060
4,510,145
4,510,169
4,510,257
4,510,271
4,510,281
4,510,326
4,510,335
4,510,336
4,510,343
4,510,353
4,510,420
4,510,447
4,510,503
4,510,567
4,510,584
4,510,585
4,510,588
4,510,619
49 : 4,509,686
4,510,029
4,510,437
51 : 4,509,523
4,509,531
4,509,537
4,509,538
4,509,751
4,509,984
4,510,277
4,510,296
4,510,623
53 : 4,509,231
4,509,287
4,509,431
4,509,498
4,509,510
4,509,526
4,509,549
4,509,653
4,509,869
4,509,957
4,509,978
4,510,135
4,510,454
4,510,572
4,510,573
54 : 4,509,550
4,509,658
4,510,196
55 : 4,509,291
4,509,292
4,509,311
4,509,426
4,509,472
4,509,612
4,509,979
4,510,450

DESIGN PATENTS

01 : 278,292
278,326
02 : 278,355
05 : 278,330
06 : 278,280
278,291
278,297
278,307
278,310
278,327
278,345
278,354

278,356
278,357
278,361
278,368
09 : 278,315
12 : 278,341
278,367
17 : 278,308
278,335
278,372
18 : 278,343
20 : 278,373

24 : 278,298
25 : 278,358
26 : 278,284
278,323
278,329
27 : 278,279
278,282
278,314
278,316
278,352
28 : 278,349
29 : 278,331

32 : 278,293
34 : 278,281
278,325
278,336
36 : 278,285
278,286
278,296
278,299
278,300
278,301
278,302
278,303

278,304
278,318
278,319
278,320
278,321
278,322
278,344
278,365
37 : 278,290
278,371
39 : 278,362

40 : 278,369
42 : 278,294
278,309
278,312
278,337
47 : 278,324
48 : 278,328
278,374
55 : 278,305
278,311
278,360

PLANT PATENTS

06 : 5,430

U.S. GOVERNMENT PRINTING OFFICE : O—1985

4,509,448
4,509,468
4,509,552
4,509,577
4,509,590
4,509,594
4,509,596
4,509,604
4,509,606
4,509,607
4,509,636
4,509,747
4,509,777
4,510,041
4,510,057
4,510,060
4,510,145
4,510,169
4,510,257
4,510,271
4,510,281
4,510,326
4,510,335
4,510,336
4,510,343
4,510,353
4,510,420
4,510,447
4,510,503
4,510,567
4,510,584
4,510,585
4,510,588
4,510,619
4,509,686
4,510,029
4,510,437
4,509,523
4,509,531
4,509,537
4,509,538
4,509,751
4,509,984
4,510,277
4,510,296
4,510,623
4,509,231
4,509,287
4,509,431
4,509,498
4,509,510
4,509,526
4,509,549
4,509,653
4,509,869
4,509,957
4,509,978
4,510,135
4,510,454
4,510,572
4,510,573
4,509,550
4,509,658
4,510,196
4,509,291
4,509,292
4,509,311
4,509,426
4,509,472
4,509,612
4,509,979
4,510,450

278,369
278,294
278,309
278,312
278,337
278,324
278,328
278,374
278,305
278,311
278,360

—1985

CHANGE OF ADDRESS FORM

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

Mail this form to: NEW ADDRESS

Superintendent of Documents
Government Printing Office SSOM
Washington, D.C. 20402

Attach last subscription label here.

SUBSCRIPTION ORDER FORM

SUBSCRIPTION ORDER FORM

ENTER MY SUBSCRIPTION TO:

@ $ **Domestic; @ $** **Foreign.**

NAME—FIRST, LAST

COMPANY NAME OR ADDITIONAL ADDRESS LINE

STREET ADDRESS

CITY | STATE | ZIP CODE

PLEASE PRINT OR TYPE

(or) COUNTRY

☐ Remittance Enclosed (Make checks payable to Superintendent of Documents)

☐ Charge to my Deposit Account No. .....

MAIL ORDER FORM TO:
Superintendent of Documents
Government Printing Office
Washington, D.C. 20402

U.S. DEPARTMENT OF COMMERCE
Malcolm Baldrige, Secretary
PATENT AND TRADEMARK OFFICE
Donald J. Quigg, Acting Commissioner